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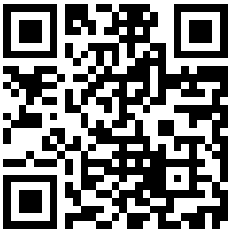

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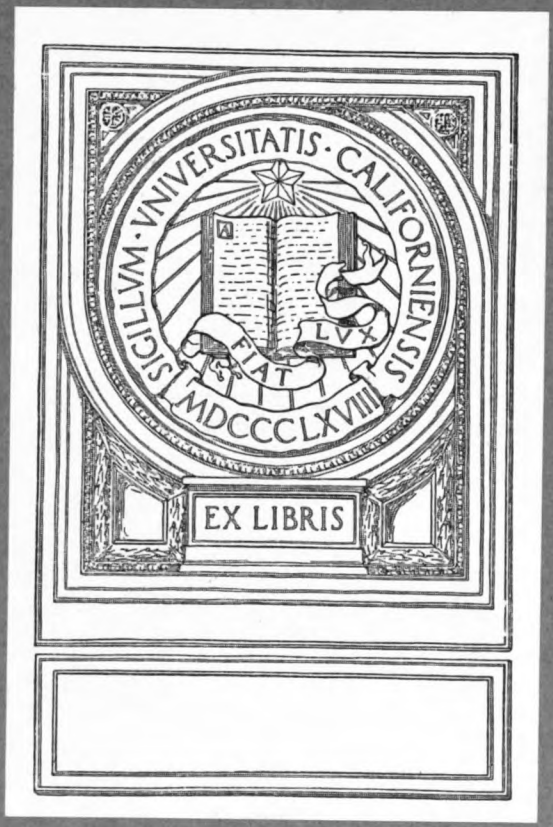

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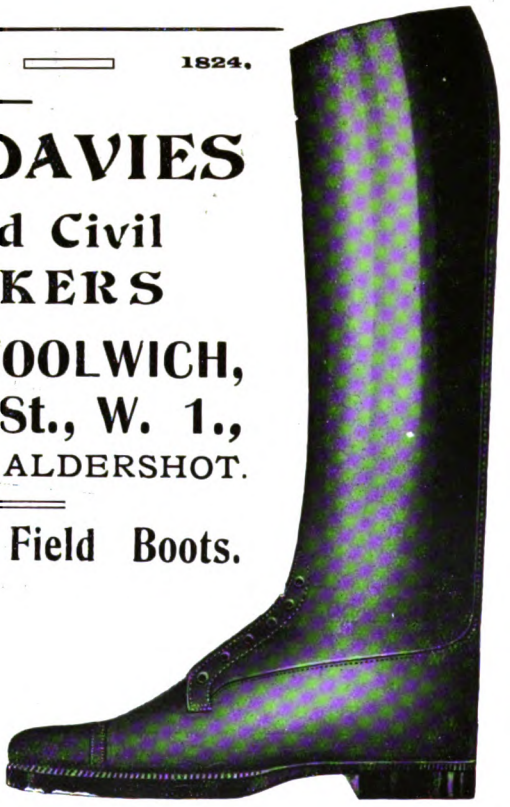

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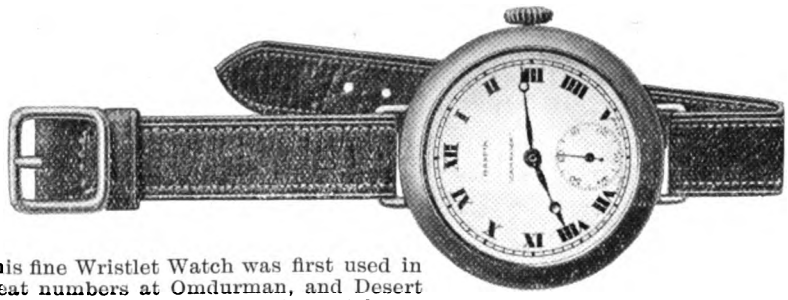

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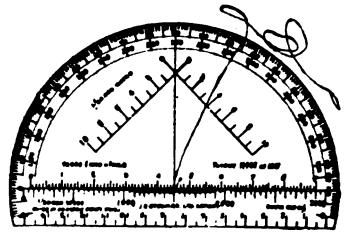

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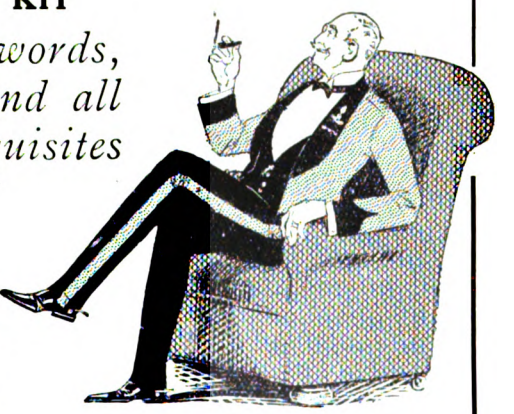

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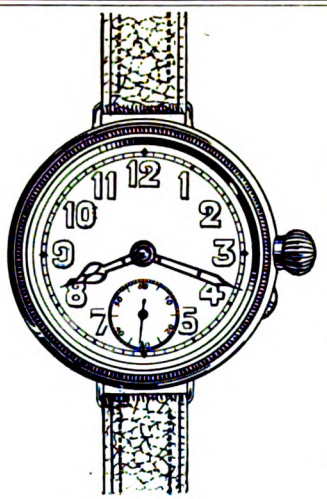

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THE NORTH RUSSIAN CAMPAIGN.

A Lecture delivered at the Royal Artillery Institution, Tuesday, February 16th, 1926.

BY MAJOR-GENERAL SIR EDMUND IRONSIDE, K.C.B., C.M.G., D.S.O.

General Sir George Milne, G.C.M.G., K.C.B., D.S.O., Colonel Commandant R.A., in the Chair.

GENERAL SIR GEORGE MILNE: Gentlemen, I do not think that I need introduce General Ironside to you. I will ask him to go straight on with his lecture.

MAJOR-GENERAL SIR EDMUND IRONSIDE: Gentlemen, I am going to talk to you to-night about the North Russian Expedition. I have already written in the R.A. Journal about the winter difficulties which we experienced and I will now try to avoid repetition. Politically the campaign was, in its later stages, much in disfavour and little has been written about it. Still, in many ways, there are more valuable lessons to be gained from it for the British Army of the future than from the main operations in France. That is my excuse for speaking to-night.

The origin of the Expedition was quite definite. About the middle of 1918 there were no signs that the Central Powers would be beaten that year. One of the great combatants, Russia, had collapsed, and the Entente had been hard put to it to meet the reinforcements which Germany was thus enabled to withdraw from her Eastern front. There were many signs that Germany intended to try to exploit Russia economically and thus secure the material with which to continue the struggle. There was also an immediate danger that submarine bases might be established at the North Russian ports, Murmansk and Archangel. The man-power of the Entente was reaching exhaustion and in their search for immediate supplies, the military authorities turned their eyes towards Russia once more. With the signature of peace between Germany and

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the Soviet some hundreds of thousands of prisoners of war had been liberated, and these men were trying to work their way home from the distant prison-camps where they had been confined. Amongst these prisoners were some 50,000 Czecho-Slovaks, devoted to the cause of the Entente and who had been formed into a corps with the help of French officers. There existed a plan for passing these men by way of Vladivostok to France, but it was soon realised that if they were to have any effect upon the situation in 1918 some speedier means of bringing them to the scene of action must be adopted. For all these considerations, therefore, it was decided to send a small force to North Russia. We may summarize the objectives of the campaign as follows:—

Main Objective.

To prevent the exploitation of Russia by Germany, should the war continue through 1918 and longer.

Minor Objectives.

1. To reconstitute the Eastern front, making use of all man-power which could not be employed otherwise and preventing further transference of German troops to the West.
2. To prevent the establishment of German submarine bases in North Russia.
3. To secure the stores, the property of the Entente, lying on the quays of Archangel and Murmansk and to prevent their transference to Germany.

The despatch of the Expedition to North Russia was ordered by the Supreme War Council, Great Britain being entrusted with the command and administration of all troops taking part. The campaign was thus truly international, nine different nationalities taking part in the operations.

A detachment of British marines occupied Murmansk in June, 1918, and in August a force of British, French and United States troops seized Archangel. As regards the Czechs, these had commenced their westward movement and were approaching the Siberian frontier. The Soviet Government, however, which did not relish their transference to Archangel and the turning of Soviet territory into a theatre of war, were putting such difficulties in the

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way of their movement that there seemed little chance of their arrival at Archangel before the fall of winter in 1918. A few Russians, chiefly of the officer class, did rally to the Entente forces, but their numbers were insignificant. Volunteering for fighting is unknown in most countries and it was found impossible to raise any enthusiasm among the Russian peasants for a return to any anti-Bolshevik régime. Although the Entente effort thus failed to restore the Eastern front, still we have definite evidence from German sources that the threat of restoration did prevent any transference of German troops to the West at a very critical period in their fortunes. It may well be asked then, why, when they had already achieved their object, they were not withdrawn before winter. Archangel is frozen up about the end of October and a decision to withdraw would have had to have been made in September. At this time there was no certainty that the Central Powers were about to collapse and at the time of the Armistice in the West the Archangel force had already been frozen up for some weeks.

During the ensuing winter the objective of the Expedition became most confused. It had been firstly a purely military effort directed against the Germans, and the Allies now found themselves actively engaged with the Soviet Government. We had espoused the cause of all elements opposed to the Soviet and we could not abandon them to their fate, after having used them for our own purposes. Military operations were always difficult during this period owing to the lack of a clear political objective.

All three services were strongly represented in North Russia and for the operations all were placed under the command of the Army Commander. As is not surprising with such a heterogeneous mass of nationalities, troops and services many mistakes were made. I think that perhaps the worst mistake that was committed was in connection with the Dwina River flotilla, and the fault lay entirely with the Army. The Expedition had pushed forward some 150 miles up the Dwina and Vologda railway and columns were in process of settling down into positions suitable for the winter. No one quite knew when the first frost would actually come and the Army fixed the 1st October as the date for the flotilla to descend the river, either to winter in Archangel or to return to England.

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No sooner had the flotilla gone than the Bolshevik gunboats came down and bombarded our positions from long range, destroying the carefully prepared winter accommodation and causing several hundreds of casualties. Had there been one or two long range guns taken from the ships and mounted on shore we should have been saved from what looked at one time like a serious collapse, for the land service had nothing that could range further than an 18 pr. A serious error of judgment on the part of the Army. In actual fact the icing up did not come for nearly a month later than was expected and the Bolsheviks had ample time for their bombardments, to which we could not reply. In such temperatures as you get in North Russia fighting depends largely on accommodation. Men cannot remain for long out in the open. If you get your accommodation destroyed you must move off to find more. Even the smashing of window panes may be a serious matter.

There were, as I said, nine different nationalities in North Russia, British, French, American, Russian, Italian, Serbian, Polish, Czech and Chinese. The columns of the Archangel force were widely separated, and at first it was thought that columns ought to be national, that is to say of one nation only, under their own commander. At all times the administration had to remain British because we were the only people who had the necessary personnel. It was soon found that in these circumstances each nationality thought that its own hardships were greater than those of any other. Out of sight out of mind, and the columns never saw each other. With mixed columns none could say that the others were loafing. Liaison troubles were of course endless, and there were few Russian speakers in any contingent except the American. Russian rifles and equipment were used by all by way of simplification but the supply of rations was complicated. Each nationality demanded some tit-bit and raised loud complaints when they did not get it. Any excuse was good enough to whip the hard-worked British administration. Winter conditions I have described and perhaps one example here will suffice. We had one fight in 85 degrees of frost—the worst day we had—and I was able to watch the fight from a look-out post. The enemy came across in white smocks, very difficult to pick up against the snow. Their attack failed and they left a few figures on the ground in front of our blockhouses.

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I must have been on the ground within a half-hour of their being wounded and yet all were dead from exposure. There was indeed one great advantage in this winter fighting. Wounds were clean, and provided a man could be got quickly under cover and provided with stimulant, he had a good chance of recovery. As regards stimulant, one of the contingents was "dry." I only wish that some of the people who ordained this had had to go through what the men did in North Russia and without stimulant. Of course the "dry" contingent managed to get their whack of either rum or "pinard," the French red wine.

The winter kit had been designed by Shackleton, the Arctic explorer, and very good it was too. *A propos* of this I remember one amusing incident. Shackleton had come across from Murmansk to talk to the men on the subject of winter conditions. Outside the hut in which he was to lecture he found a man standing who was not wearing his "Shackleton" boots. These boots had been made for skiing and had absolutely smooth soles. To adapt them for general purposes a kind of football bar had to be put on the sole. Without these it was quite impossible to walk on frozen snow. On Shackleton enquiring why the man hadn't his boots, he received the reply, "Lor Lumme Guvnor I must give my backside a chance." I think the production of some 50,000 winter kits was a feat of which the British War Office might well be proud.

As is always the case in small wars, mobility was the key to success. In North Russia neither side was mobile. Had there been even a body of 500 expert skiers such as one meets in Norway, the side which possessed them would have done what it liked with the other. Though to teach men to use snow-shoes was simpler than teaching skiing, and though ample kit and sufficient instructors were available very little could be done in the time.

Besides the fighting which took place continuously on one or other of the fronts the chief business of the British command lay in the organisation and training of the local Russian forces. These forces were raised to 20,000 before we left. Such fine material. Well-clothed, well-fed and seemingly content. The lot of the Russian officer was hard. Many had been through the Revolution in all its stages and had been shot at by their own men. Others had done years of imprisonment in Germany and Austria. Is it sur-

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prising that many of them had deteriorated? They did not understand our methods of intensive work and training. They considered that we were amateurs, whereas we were experts in raising armies from nothing. Our officers were impatient of the dilatory Slav mind which is so easily raised or depressed. As an example of Russian methods of maintaining order I will quote you three orders which were issued by senior commanders. I am afraid that they would create nothing but merriment were they to be issued to our officers and men. Here they are.

"Yesterday, the 10th December, at 10 p.m. I was walking near the Lomonosoff school. From the direction of the Cathedral I heard a disgusting flow of gutter language. Going further I met two sailors, and approaching one of them called his attention to the absolute impermissibility of such filthy language in the street. The other sailor went on, but the one to whom I addressed myself slovenly declared that he was intoxicated and with an impudent gesture blew his nose on the pavement. Wishing to have a closer view of this representative of our military forces in course of recreation, I directed him to a lightened window. Here I convinced myself that he was without his striped vest and that he had a naked neck. Telling him he was improperly dressed I ordered him to follow me to the first military post to which I would hand him over. The sailor quickened his pace, rejoined his companion and both made off. With the help of the guard of the British Commander-in-Chief I detained both. The second sailor began to justify himself and I asked him whether he was wearing his striped vest. Upon opening his jacket I saw a striped vest with a woman's locket clasping it at the top. I ask myself the question. When will these people realise that they are disgracing the honourable uniform of a defender of his native land by carrying on themselves women's ornaments? The names of the sailors are so and so and so and so. I request that Rear-Admiral X. will investigate all this and act according to the law. How pitiful is all this and how deeply disgusting!"

"Madame Botchkareva arrived from Shenkursk and reported to me on December 26th. She wore officer's uniform of a Caucasian pattern with shoulder straps and was accompanied by Lieut. Filipoff whom she called her Adjutant. Madame Botchkareva offered me

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her services for the organisation of the Russian army. I do not undertake to estimate the merits of Madame Botchkareva in the organising of the Russian army and I consider that her work for her country and the shedding of her blood will be finally appreciated by the Central Government and Russian history. I only consider it my duty to declare that within the limits of the Northern region, thank God, the time has already come for quiet creative Government work, and I think that the summoning of women for military duties, which are not appropriate to their sex, would be a heavy reproach and a disgraceful stain on the whole population of the Northern Region. I order therefore that Madame Botchkareva shall take off her uniform and breeches and that Lieut. Filipoff shall report to the Town Commandant."

"Talking to-day to Captain A., I was told that Lieut. Y. had said that Yemetskoe and Seletskoe had been captured by the Bolsheviks. On being asked by Captain A. where he had heard it, Y. said that I was supposed to have said it to some young lady. I am not acquainted with any young ladies in Pinega and have not been sent here to flirt but to fight, I demand from officers and privates, who during their free time flirt with women not to discuss with them military matters, but to entertain their ladies with subjects more interesting for them, such as love, the moon, etc. It is scandalous to spread silly panic rumours."

It can be imagined how difficult it was to hurry such commanders.

In the late war propaganda became a legitimate weapon of war. The Bolsheviks made full use of this weapon. Every tree outside our lines was plastered with pamphlets in every language. I think I can honestly say that this campaign had little or no effect upon the British soldier. He treated the propaganda with the kindly contempt which he adopts to all foreigners. And one can say that our men showed up well amidst all the contingents. They fought well and cheerfully. I believe myself that tradition is greatly responsible for this. The Britisher has always fought outside his own country. The British Empire has made this so. Other nationalities may shine in defence of their own homes but not abroad. I myself came in for a goodly portion of vilification, and one of the pamphlets showered upon me ran as follows:—

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"A 'White Guard' proclamation, signed by General Ironside, Commander-in-Chief, has reached us. This proclamation was addressed to one of our Regiments stationed on the Northern Dwina.

All soldiers of the Red Army must pay attention to what it says.

To give Mr. Ironside his due it must be admitted that there is a certain amount of truth among his infamous lies. He boasts 'Our victorious (ahem . . .) troops are hurrying north and bring with them terrible engines of destruction which you have never yet seen.' He adds 'this is not the first time that we have made a descent upon another country. We are past masters in the art.'

Perfectly true, General, you English together with your Allies wish, by the use of guns, ships and other engines of war never yet heard of, to devastate our fatherland. Very true. But why wag your tail about it? Why end your proclamation with lies?

Because, General, you foresee what reply you will get from the sons of our socialistic Fatherland in answer to your impudent proclamation. You know that hundreds of thousands of Russians will cry as with one voice. No! This shall never be! We will never surrender our Fatherland, striving for better things, to be plundered and destroyed by British robbers.

General, you know this well, and for this reason you end your address with lies 'behind the Commissars stands Germany, guiding the affairs of Russia and through your blood trying to save her own skin.' Who will believe this? For, at Versailles at this very moment those butchers the Allies are themselves skinning the Germans (by the Versailles Peace). In view of this it would not be a bad thing if you were more discriminating in your fictions. True, much discrimination cannot be expected of General Ironside—this bandit was brought up in another school. In the past this "General-feldwebel" was renowned for his rough and bullying treatment of the soldiers under him and for his servile attitude to his superiors. The mere sight of this great hulking red-haired overgrown boy makes one want to spit in his face . . . .

Into the sea with the red-headed feldwebel Ironside!

Long live the steadfast and mighty Red Army!"

One of my own personal difficulties was my dealings with the many distinguished Ambassadors and Ministers who were shut up

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with us in Archangel. The Commander-in-Chief was a kind of neutral in respect of his dealings with them. There were difficulties of housing, heights of flag-posts and privileges of buying at our canteen. In similar circumstances I can only recommend all soldiers to deal entirely through the British Minister, if they can find a sympathetic one as I did. A diplomat can arrange things so much better. I found also that the precedence of contingents was not easy. When I thought I had settled matters by ordering an alphabetical precedence for ceremonial parades I was met with a demand for the U.S. troops to march as Americans. The small internal difficulties of an Army were much magnified by the number of different codes—were they legal or with reference to sanitation or other discipline.

During the long winter frequent personal visits from the Commanders of all ranks to their commands was the best means of maintaining moral. Little scraps of authentic news were eagerly awaited. Perhaps, with the advent of wireless, even small columns in the desert or bush may be given each evening the football and racing news of the day. If that is achieved I can only say that it will be the most magnificent raiser of moral ever produced in war.

The means of transport were perhaps the most varied ever employed in the field. Sledges pulled by men, ponies, reindeer and dogs with the men on skis and snowshoes in the winter, and native carts and river craft from luxurious Thames steamers to coastal motor boats in the summer. For Command, Staff and Liaison work seaplanes were of inestimable value. On the innumerable lakes and rivers it was possible to land anywhere in summer, whereas aeroplanes found only bad landing places with a consequent increase in the number of crashes. With a seaplane it was possible to come down on the lines of communication and inspect a stoppage and be away again in a few minutes after an interview. For future river campaigns proper comfortable liaison seaplanes will be necessary, for it should not be forgotten that a commander does not commence his work until after he has landed and he should be as fresh as possible.

Before the ice had broken in April 1919, a decision was come to by the Supreme War Council that the Allied troops were to leave Archangel before the advent of winter in October of that

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year. Evacuation was no simple matter, for in addition to the 15,000 Allied troops there were some 15,000 to 20,000 civilians, men women and children, who had some claim to be evacuated to their homes. The majority of these people came from the newly constituted states in the Baltic and from Poland. The shipping available was not large, and evacuation could not start before May or June because of the ice conditions in the White Sea. Would the Russian mobilized troops be able to stand up after our departure? Would the evacuation of the Allied troops be able to take place under cover of these Russian troops, or would the whole affair have to be carried out as a military operation? These questions were by no means easy to settle, for the Russian troops were only half-trained and they might refuse to take over from us, when they saw us going away and deserting them, as they would probably think. The moral of these Russian troops depended a great deal upon what happened in Siberia with Kolchak. Could a junction with the Siberians be effected all would be well.

The British Government decided to run no risk, since they were responsible for the safe evacuation of several foreign contingents. Two strong mixed brigades of volunteer troops were therefore sent out to Archangel during May and June. Evacuation of all the civilians and of the Allied troops of the winter commenced at once and continued uninterruptedly till the end of August.

By May some 15,000 mobilized Russian troops had passed up to the various fronts to complete their training, and two of the lesser columns had been handed over to the Russian command. The two British Brigades took over the important fronts, and plans were got ready for disengaging operations, with a view to placing the Russians in as favourable positions as possible. It would certainly be cheaper in the long run if we could evacuate our final detachments peaceably.

Very soon it became evident that Kolchak was not doing well and that a junction with him was out of the question. The spirits of the Russians flagged visibly. The enemy redoubled his efforts at propaganda against the young troops, and unfortunately with good success. Two most serious mutinies took place, in one of which 5000 men passed over to the enemy after murdering their officers. Another took place in the 1st Bn. of the Slavo-British

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Legion, when portions of two companies murdered their officers at night and some 300 men passed over to the enemy. I should like to say one word about the Slavo-British Legion, for its failure to do good service was a bitter blow to us all. The original Russians who had joined the Allies in Archangel were formed into a Legion of some 500. Their numbers gradually dwindled and no fresh recruits were forthcoming. All through the winter we had been capturing large numbers of prisoners from the enemy, and after careful examination I found that the large majority of these men were peasants conscripted in other parts of Russia. It was impossible to maintain them in idleness in prison-camps owing to lack of accommodation and the necessary guards to watch them. The experiment was commenced of drafting them into companies and mixing them with the original volunteers who formed the officer and non-commissioned officer element. These companies fought well and proved themselves quite trustworthy. It was then decided to form battalions under British officers and to subject them to intensive training. After a couple of months training the 1st Bn. left for the front and I think I can honestly say that it was a very fine unit. The greatest care had been taken in the drafting of the men, but as experience showed we had allowed bad characters to slip through. The enemy had heard of this Legion and special men were sent across to pass into the units and cause them to mutiny. Time was against us in the experiment. It speaks volumes for what the gallant young British officers had done with their men, when I tell you that two companies and the M.G. company stood fast on parade while the mutiny was going on and afterwards cleaned up the situation. The attitude of the Russian authorities towards these British trained units had never been very friendly and I most reluctantly had to turn them into labour units. The Russian officers were against continuing to serve in these units and the British officers alone could never have gained sufficient touch with their men owing to language difficulties alone, and so the experiment came to an end.

The spirits of the mobilized Russians became so bad towards the end of August that I made plans to disarm them in the event of further trouble. I could not afford to fight them as well as the Bolsheviks during the evacuation. The situation was relieved,

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however, by a brilliant attack carried out by General Sadleir-Jackson's Brigade on the Dwina. By the time Lord Rawlinson arrived to superintend the evacuation of North Russia, the front on the Dwina was completely free of Bolsheviks and the Russians could take over in peace. On another front the Russians themselves carried out some very successful attacks, and our final embarkation was carried out without a shot being fired. The operation itself, though peaceful, was a fine example of naval work. Over 6000 fighting troops were picked up simultaneously from seven different points and the time-table for dropping down the Dwina was kept to the minute. Arrangements were even made for the picking up of any possible stragglers by tug-boats. It was well they were, for right in the middle of one of the great quays a tug-master found a solitary British soldier sitting on an officer's valise. Upon being hailed and asked what he was doing the reply came. "Beg pardon, Sir, but I'm Mr. Snodgrass' servant and he told me to wait here till he came back." Thus was rescued the last of the Allied Expedition to Archangel.

I think that we all left Archangel with a sigh of relief. We had certainly done our best under trying circumstances. We left without actively quarrelling with our late friends, if not wholly with honour, and we were certainly not to blame for the vagaries of the policies which had sent us there and taken us away.

There is one great lesson to be learnt from the campaign and that is, that it is almost impossible to limit the scope of a military expedition when once it has been launched. There are always demands for reinforcements which cannot be refused. The North Russian Expedition started with the landing of a few hundred marines at Murmansk and ended with some 50,000 troops of nine different nations advancing some hundreds of miles into Russia. (Applause.)

CHAIRMAN: Gentlemen, I hope some of you will ask the General questions, because one of the great advantages of these Lectures is that you can learn about things you want to find out for yourselves.

MAJOR PEASE-WATKIN: How do you keep aeroplane engines running at that temperature?

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GENERAL IRONSIDE: It was very difficult. They did keep them going with flameless lamps. We did get flying right through, except on the very worst days, but it was very difficult. The pilots had electrically heated clothing for their flights. Of course there are sudden drops in temperature. During snow, when the temperature is highest, you could not fly, but immediately after the snow, before the temperature had sunk down again, you could get in good flights. The landings, of course, were made on skis; all the aeroplanes were on skis and not wheels. One of the Gunner points in regard to cold that might interest you is this: To get your winter supply of ammunition you had to arrange for it to be sent out during the really very hot months of summer. Winter ammunition was then badly affected. On the very cold days we found that the range with 18 prs. was some 600 yards short in 2500, which is pretty considerable when you come to think of it. To get the right stuff to fire at the right moment was very very difficult indeed.

CHAIRMAN: It only remains now for me to thank General Ironside for the most interesting lecture he has given us. (Applause.)

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THE EVOLUTION OF ARTILLERY IN THE GREAT WAR.

VII.—THE EVOLUTION OF ARTILLERY TACTICS (3).

By Major (Bt. Lieut.-Colonel) A. F. Brooke, d.s.o., *p.s.c.*, R.A.

III. Period of Neutralisation.

IN the previous article we had reached the climax of the Period of Destruction as exemplified by the artillery tactics adopted at the third battle of Ypres. We had noticed, however, that during the latter part of this period attempts were made to regain the secrecy which had been lost through the length of our destructive preliminary bombardments. These attempts were meeting with serious opposition. We had established the fact that a limited success could be ensured with the tactics we were employing, whilst the suggested new method relied mainly on the neutralising properties of artillery which were not fully appreciated. Secrecy in the attack entailed the use of unregistered and unobserved fire in support of the attack. It was argued that in view of the necessary proximity between attacking troops and their supporting fire, registration could not be dispensed with. The new methods entailed both the sacrifice of the known advantage of destruction, and the risk of unregistered fire in the attack, consequently entailing grave responsibilities on a commander adopting such tactics.

The evolution of tank tactics had, however, exercised a direct bearing on the problem. Up to the present it has been unnecessary in these articles to consider the introduction of tanks, since the methods employed in handling this new arm called for no change in our artillery tactics. Although tanks had made their appearance in the latter stage of the battle of the Somme, yet from this time till the end of the third battle of Ypres they had been assigned a position in rear of the foremost attacking troops. Although

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possessed of exceptional wire crushing properties, this factor was not made full use of, and the artillery was left responsible for the destruction of wire obstacles. The shell torn nature of the ground on which the tanks had been employed had also militated against their efficient employment and led to false conceptions as to their supporting value in the attack. We had evidently in this new arm a means by which a proportion of the tasks of the artillery could be reduced, namely :—

(a) The wire entanglements could be rendered passable for infantry without previous artillery preparation.

(b) The hostile small arm fire could be neutralised by the automatic weapons of the tank, until such time as the assaulting troops were in a position to deal with it through their own means.

The above factors greatly simplified the problem confronting us. An efficient means of dealing with wire obstacles during the actual assault reduced the arguments in favour of a destructive preparation; whilst the neutralising properties of the automatic weapons of the tank also diminished the necessity for the close proximity of the supporting fire to the assaulting troops. Unregistered and unobserved fire, consequently, presented lesser dangers. The protection of the infantry during the attack would be partly taken over by the tanks, but whilst partially freed of this duty the artillery was confronted with the new problem of protecting the tanks.

1. *The battle of Cambrai.*

The new methods were put to the test at the battle of Cambrai, which proved conclusively their efficiency. The employment of tanks under suitable conditions, and in a tactical manner better calculated to derive the full advantages from this new weapon, enabled us to regain the lost secrecy. The preliminary bombardment was dispensed with entirely, whilst all previous registration of guns was equally abandoned. The strictest secrecy was enforced in all preparations for the attack. The normal artillery activity was maintained up to the moment of the attack to prevent the hostile counter-battery intelligence system from suspecting any alterations in the artillery dispositions. The absence of previous

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registration was compensated for by developing to the utmost the various methods for ensuring accuracy of unobserved fire, such as meteor reports, classifying and sorting of ammunition, accuracy of maps, employment of survey sections, and corrections for muzzle velocities, etc.

Secrecy in the deployment of the artillery was ensured by carrying out all moves under cover of darkness. Positions were selected, marked by pegs by survey company, and only occupied at the last possible moment. Ammunition dumps were concealed under all available cover, a free use was made of camouflage, and the surface of the ground left undisturbed.

The protection of the tanks during the attack presented new artillery problems to be solved. Small arm fire presented but small danger to the tanks, but on the other hand the hostile gun fire was of vital importance. The enemy's artillery had now become the primary objective of our own artillery. The absence of preliminary bombardment ensured greater accuracy in the information available as to the hostile artillery situation at the moment of attack, thus increasing the efficiency of neutralising counter-battery fire during the assault. But even with the most efficient counter-battery organisation it was impossible to locate silent hostile batteries and anti-tank guns. Evidently neutralisation of fire alone would not be sufficient, the hostile power of observation must also be reduced if the safety of the tanks was to be ensured. This result could best be attained by a free use of smoke screens. We find therefore both intense counter-battery neutralisation and a free use of smoke screens as two of the main tactical features in the artillery support of the attack. All known hostile battery positions were in the first place subjected to an intense period of neutralisation with lachrymatory gas shell. Some seventy 60 prs. were available for this task with an allotment of 16,000 rounds of ammunition. By forcing the hostile artillery to wear gas masks from the outset of the attack its efficiency was reduced. It is interesting to note that the original calculations for this task were based on the employment of 156 60 prs., a number which could not be rendered available. On completion of the gas neutralisation by 60 prs., these tasks were taken on by 6″ hows. firing H.E. whilst the 60 prs. were employed to sweep the approaches.

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To conceal the tanks from observation smoke shell were employed in two distinct methods. In the first place the composition of the actual barrage, fired by a density of one 18 pr. to 25 yds. of front, was altered to include a mixture of 1/3rd shrapnel, 1/3rd H.E., and 1/3rd smoke shell. The barrage was maintained some 300 yds. in advance of the tanks, and lifted from trench to trench and not by increments of 100 yds. In addition to the above various distinct smoke barrages were established on a total frontage of some 10,500 yds. No less than 18 field artillery brigades were allotted for this task, with a provision of 70,000 rds. 18 pr. and 23,000 rds. 4·5″ how. smoke shell. The intensity of the artillery barrage was increased by 6″ how. batteries firing on a general line 500 yds. in front of the tanks, whilst heavy howitzers opened concentrations of fire, for the first 15 minutes after zero, directed against all main centres of activity. Finally a detailed plan of long range harassing fire was arranged for long ranging guns.

Several important artillery lessons were gathered from this attack, which radically influenced our future tactics, and which may be briefly summarised as under :—

(a) The possibility of dispensing with previous artillery registration in the support of an attack.
(b) The rapidity with which operations could be staged, when preliminary bombardments were dispensed with, owing to the reduced quantities of ammunition required.
(c) The higher standard of artillery efficiency at the moment of the attack, owing to its energy being unimpaired by exertions of previous bombardment.
(d) The value of smoke in screening tanks during an attack.
(e) The difficulty of engaging single hostile anti-tank guns resolutely handled.

The above lessons were carefully studied and proved of great value in our offensive operations of 1918.

2. *The Battle of Riga.*

We have up to the present only examined the German artillery tactics as employed at the battle of Verdun in 1916. Since this

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date the offensive operations carried out on the Russian front had provided them with ample experience on which to frame the new artillery doctrines which proved so successful on the western front in 1918. If we take into consideration the fact that the Germans had not deemed it advisable to adopt the tank as a new offensive weapon, we may well ask ourselves how it was that without the assistance of the new arm they succeeded in gaining tactical successes on the western front in 1918, which compared favourably with those of our own forces? The answer to this question appears to lie almost entirely in the tactical methods which they had adopted in the handling of their artillery.

We have seen that the Germans had contemplated the use of trench mortars for siege operations prior to the commencement of hostilities. The advantages of such a weapon under conditions of trench warfare had been quickly recognised by them, with the result that both in the construction and use of these weapons the Germans retained a superiority throughout the war. Again, as the pioneers of gas warfare they had established and maintained the lead in the employment of gas through the medium of artillery. There is no doubt that these two factors were of great assistance in the majority of their successful offensives, but were not, in themselves alone, sufficient to account for the success gained. The true cause is to be found in the tactical methods employed, and which appear to have been mainly influenced by Colonel Bruchmuller, whom we have already seen classified by General Herr as "the commercial traveller in the handling of massed artillery."

The beginning of the war found Bruchmuller in command of a Guard Landwehr foot artillery battalion, and staff officer of the foot artillery of a fortress. By November, 1914, he became C.R.A. of the newly-formed 86 Division, and distinguished himself in the handling of the artillery at the battle of Narotchsee in 1917. He was subsequently employed in connection with the artillery preparations for attack on the eastern front in 1917, and finally appointed to the staff of the O.H.L. and entrusted with artillery plans for offensive operations on the western front in 1918.

As the battle of Riga affords the first example of the new German artillery tactics employed on a large scale, they are worth a moment's study. It should be noticed that this operation was

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carried out in September of 1917, and consequently prior to the date of our offensive at Cambrai. The operation is also of special interest as it entailed the crossing of the River Dvina, some 300 yds. broad; in view of the present tendency to select defensive positions protected against tanks by a river obstacle, this action provides an example of tactical methods independent of any tank assistance. Any deductions that may be drawn from the results of the attack should, however, be tempered by making due allowance for the inferiority of the fighting qualities of the Russian troops defending the river.

The attack was carried out by three German divisions on a front of some 9 kms. The crossing was, in the first place, carried out in boats, three bridges being subsequently erected. The attack was prepared by a bombardment of slightly over five hours' duration, which possessed the properties of a true hurricane bombardment, with real neutralising properties, extensive destruction was neither expected nor looked for.

The Germans were at this period undergoing a divergence of opinion as to the possibility of unregistered artillery support identical with those existing in our own and the French army. Although a school of thought existed favouring the use of predicted fire, rooted prejudices against such action were still in the majority. We therefore find at Riga a compromise between the two methods, the bombardment started at 4 a.m., but facilities were afforded for partial registration during the bombardment as soon as daylight admitted.

The country on the German bank of the R. Dvina was wooded and favoured the secret deployment of the 750 guns of all natures and 550 trench mortars destined to support the attack.

The artillery was organised as IKA, AKA, FEKA and SCHWEFLA. (See "The Evolution of Artillery Organisation and Command"—Royal Artillery Journal, Vol. LII, No. 3.)

Gas shell were extensively employed for this operation and used in the following proportions:—

AKA batteries (counter-batteries) rather more than 3/4 (Blue and Green Cross).

IKA ,, (infantry support) rather less than 1/5 (Blue and Green Cross).

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During the first two hours of the bombardment both AKA and IKA batteries were employed in gassing the hostile batteries, whilst three field howitzer batteries were specially employed in gassing command posts, O.P's, telephone exchanges, etc. At 6 a.m. the AKA batteries continued gassing hostile batteries, whilst IKA batteries engaged the infantry defences. The bombardment continued till 9.10 a.m. and was divided into four distinct periods during which various portions of the defence were subjected to different combinations of the hurricane bombardment. During the final 10 minutes a proportion of the AKA batteries left one gun firing on the hostile batteries, and concentrated the remainder of their fire on the front defences, with the object of assisting in covering the crossing of the river by the assaulting troops. We shall return to this nature of bombardment when studying the German offensives on the western front in 1918, it is therefore sufficient for the present to notice that it varied radically from the methods employed by us up to that date.

At 9.10 a.m. the attack started and was supported by a form of creeping barrage, which calls for no special remarks. The attack was a complete success. The defensive artillery fire was practically negligible, and only a few casualties were suffered in the erection of one of the three necessary bridges. Some of the Russian batteries are reported to have been panic stricken by the gas bombardment, and to have abandoned their guns. The operation was of the greatest value to the Germans since it provided them with a concrete example as to the results to be expected from their new tactical methods which we shall find firmly established by the Spring of 1918.

3. *Winter of 1917-18.*

The collapse of Russia and entry into the war by the Americans had now created a new strategical situation. We were thrown on the defensive until such time as the American forces should materialise.

Our artillery tactics of the defence had not up to date been subjected to any very severe tests. We saw the germ of the S.O.S. barrage taking shape during the winter of 1914. From then onwards the attacks to which we were subjected were usually of the

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nature of a counter-attack subsequent to one of our offensive operations, or in the shape of trench raids. In the former case we were provided with an "attack density" of artillery with which to meet the attack, whilst in the latter, the limited front of attack admitted of concentrations of fire being carried out through systems of mutual support. Our tactical deductions had consequently been in the majority of cases based on a density of artillery normally unavailable on an extended defensive front. We had grown to look upon defensive artillery fire in the shape of a rigid curtain of shells placed as near as possible to our front defences. With a density of at least one 18 pr. per 20 yds. of front, backed by medium and heavy artillery, such a procedure was calculated to stop hostile attacks before they could reach our front line troops. But a defensive density of one 18 pr. to some 300 yds. offered no resistance to a determined attack. Instructions were consequently published during the winter of 1917-18 laying down that in the defence artillery fire should be employed to deny the enemy important tactical features, whilst the intervening spaces should be allotted to machine gun and trench mortar protection. "Counter preparation" fire had also been introduced with the object of interfering with hostile preparations for the attack, and to engage the forming up places of attacking troops.

Our artillery tactics of the defence still retained too much rigidity both as regards time and place. The change from "counter preparation" to "defensive barrage" necessitated exact information as to the moment the hostile attack was launched. Such a procedure was possible in the case of an attack based on our own most recent conceptions and preceded by no preliminary bombardment. But the German hurricane bombardments of 1918 made it impossible to estimate the actual moment the attack was launched. Frequent S.O.S. signals were fired during the bombardments, continuous defensive barrages could not be maintained indefinitely, and it is probable that in many cases owing to interrupted communications the guns of the defence were only firing at slow rates at the critical moment.

In our endeavour to engage the leading elements of the hostile attack, were we not neglecting the fact that an attack to be successful must be organised in depth? By engaging hostile supports

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and reserves, which offered better targets for the artillery, the impetus of the attack could be checked, whilst the infantry disposed of the leading troops with their own weapons.

4. *German Offensives of 1918.*

We have seen that as a result of the successes obtained at Riga Colonel Bruchmuller was appointed to the staff of the German O.H.L., and entrusted with the artillery plans for the western offensive of 1918. The tactical methods employed consequently bear a striking resemblance to those which we have just examined.

The very greatest importance was attached to absolute secrecy in the deployment of the artillery for the attack. In the large scale attacks each assaulting corps had allotted to it approximately the front of one of the defensive divisions holding the line. All artillery preparations for the attack of the corps were entrusted to the C.R.A. of the defensive division. On the arrival of the attacking corps the C.R.A. of the division in the line became the commander of the "AKA," namely C.B.O. of the corps, whilst the senior foot artillery officer was selected a commander of the "FEKA," in charge of the harassing fire. Such a procedure facilitated the artillery preparations for the attack, and ensured that the commanders of both the "AKA" and "FEKA" were thoroughly familiar with conditions prevailing on the front of attack.

In order to ensure secrecy in the deployment of the artillery, batteries were classified in three categories :—

(a) Those that could be placed in position at once without any fear of detection.

(b) Those that could be hidden close to their ultimate positions, and man-handled into action on the night prior to the attack.

(c) Those which could only be placed into action on the night prior to the attack.

The latter category was reduced to a minimum to keep the roads clear for the attacking troops. Out of a total of 1100 batteries required for the attack of the 27th of May, only 20 batteries were classified under (c).

Although the attacks at Riga had proved that previous registra-

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tion could be partially dispensed with, strong prejudices still existed against such methods. During the preparations for the attack of the 21st of March one army is reported to have addressed a letter to the H.Q. of Prince Rupprecht's Army Group stating that :—"It wished to take exception to the new methods of attack supported by unregistered artillery fire, and to press to be allowed to order accurate registration." This request received the curt reply that :— "If registration must be carried out, the Army Group will not attack" ! The German opposition to the introduction of unregistered artillery support forms an interesting parallel to the unfavourable reception which such methods also received in our own army.

The German method of arriving at the required density of artillery to support an attack, were on the whole very similar to our own. In the first place at least one battery was allowed for each known hostile battery on the front of attack, with a few extra batteries to engage possible unlocated batteries. For the hurricane bombardment, calculations were based on the nature of the defensive system to be engaged combined with the necessity for maintaining several successive lines simultaneously under fire. A frontage of 100 to 150 yds. per battery was considered adequate, whilst extra batteries were added to engage command posts, observation stations, machine gun nests, etc. For the large scale offensive of 1918 Bruchmuller states that the demand for guns always exceeded the number available, in spite of Ludendorff's special efforts.

As regards the selection of types of equipment for the various tasks it is interesting to note that during the last one and a half years of the war field guns were extensively used for counter-battery work. This was due to the fact that the large numbers available, combined with their rapid rate of fire, rendered them especially suitable for firing gas shell. Such a procedure also liberated a larger number of howitzer batteries to engage the more distant battery emplacements. Trench mortars were definitely recognised as a wire cutting weapon, whilst great reliance was placed in the moral effect of these weapons when participating in the hurricane bombardments. These weapons were used whenever their limited range admitted of their efficient use, an allowance of one medium or heavy mortar being made for every 25 to 30 yds. of the front of attack.

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Each attack was preceded by a typical hurricane bombardment. The object of such a bombardment is indicated by the literal translation of its German name, namely the "Assault-ripe-making-fire." The following extract from Bruchmuller's book also shows clearly that destructive results were not sought for in such bombardments. He states :—"With a preparation of only a few hours, naturally no complete destruction of the enemy's trenches and obstacles could be expected. That was also certainly not the intention. One wanted to shatter the moral of the enemy by the fire of the artillery, to banish him to the bottom of his trenches and dugouts, and by an unexpected assault to overcome him." From the above it is clear that the tactical methods employed aimed at effects of neutralisation and not of destruction.

The moral, and disorganising, effect of the bombardment was in itself not considered sufficient, and the tactical handling of the artillery was therefore so organised as to induce the defenders to remain hidden in their shelters even when the fire was temporarily withdrawn. This was achieved by carefully timed barrage lifts during the preliminary bombardment, by which successive trenches were uncovered temporarily only to be subjected to a crushing return of the barrage. The fire was repeatedly withdrawn from the forward defences whilst the assaulting troops waved their helmets and shouted in order to induce the defenders to man their parapets only to be met by a return of the fire. Finally, at the moment of the attack the assault was launched with no appreciable alteration in the intensity of the bombardment.

The distribution of the artillery fire during the hurricane bombardment varied somewhat in the various offensive operations, but was generally speaking sub-divided into three distinct phases :—

(a) A general bombardment of all defences, battery positions, command posts, telephone exchanges, billets and headquarters, carried out as far as possible with gas shell.

(b) All AKA and the majority of the IKA batteries were concentrated on hostile guns, with the object of placing the hostile artillery temporarily out of action; namely an intensive counter-battery phase.

(c) IKA batteries returned to the infantry defences, alternating from one line to another, whilst the AKA, FEKA and SCHEFLA settled down to their respective tasks.

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Turning now to the support of the actual attack we find that the German tactics were on the whole very similar to those prevailing in our own army at that time. The whole of the IKA batteries and a proportion of the AKA batteries were brought on to the front line of defences during the final stages of the hurricane bombardment, whilst the attacking troops left their shelters and closed in on the line of bursting shell. This barrage, or "fire-roller" as it was known in the German army, moved forward in bounds varying from 50 to 200 yds. These lifts were originally regulated by light signals, but as such a procedure apparently proved unsatisfactory a true time programme was resorted to, whilst in the final attacks attempts were made to regulate the lifts by a combination of time and light signals. The rate of the barrage was definitely fixed, but battalion commanders were provided with light signals and authorised to make use of them on certain stipulated lines to increase the rate of the barrage if necessary.

For the attack of the 27th of May on the Chemin des Dames a double barrage was provided. The IKA batteries were subdivided into two groups, IKA (a) and IKA (b), the former fired mainly H.E. ammunition, whilst the latter fired non-persistent gas shell (Blue cross), and were directed against definite systems of defence at least 600 yds. in front of the attacking infantry.

The Germans had apparently found no better solution to the problem of close support during the attack than we had. Definite batteries were maintained limbered up for close support purposes, and destined to follow close on the heels of the infantry. These batteries were provided with special assistance of pioneers to help them in crossing obstacles. They are reported to have rendered valuable services, but to have suffered extremely high casualties in doing so.

The above rapid survey of the German artillery tactics in their offensive operations of 1918 can necessarily only be of a superficial nature. It should, however, be sufficient to illustrate the main differences existing between these methods and the ones we were employing. When we take into account the tactical successes gained by the use of such methods, it is of interest to consider whether it would not have been possible for us to adopt similar ones in 1917, and the probable results of such a procedure.

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5. *French Defensive Operations in Champagne (July 15-18).*

A few moments may well be devoted to examine the final failure of the German offensive methods, and the singular success of the French defence.

In the first place it should be noticed that the German secrecy measures, which had up to date been such a conspicuous feature, showed the first signs of deterioration. The fact may have been partly due to over-confidence, partly to carelessness engendered by fatigue, and partly to a series of unfortunate circumstances. Whatever the causes may have been, the results were disastrous to the success of the operation. By the 6th July the French held fairly accurate information as to the impending attack. From this date onwards they carried out careful artillery counter preparation, and drew up the necessary measures to meet the attack. Special arrangements were made for the withdrawal of the troops from the forward zone, and for a corresponding application of the defensive artillery fire.

On July 14th at 2200 hours 27 prisoners were captured in a raid, and from their interrogation information was obtained that the German attack was to take place that night, preceded by a hurricane bombardment lasting from three to four hours, and commencing at 0010 hours. From 2300 to 2340 hours all the French artillery opened fire against the German batteries and assembly areas. At 0445 hours the Germans launched their attack on a 90 km. front. As a result of the French defensive measures the attack was in most places brought to a standstill against the main line of resistance. Although the main causes of failure of the attack must be attributable to loss of secrecy, there are however a few minor causes which are of interest. Owing to the shortage of artillery required to stage an attack on so wide a front, extra guns had been issued to German batteries raising them to five and six guns. The necessary personnel to man these guns had been found from ammunition columns, parks, etc. This dilution of personnel reduced the efficiency of the artillery which was also showing distinct signs of weariness owing to the continuous offensive operations it had been engaged in, and probably reacted unfavourably on the artillery support of the attack. The failure cannot, however, be solely attributed to either the tactics or efficiency of the German artillery in this attack.

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6. *Amiens Offensive (August 8th).*

The battle of Cambrai had proved to us that by employing tanks, and dispensing with previous artillery registration, the element of surprise could be regained in our methods of attack. On July 4th at Hamel these methods had again been put to the test and proved successful. The French had also quickly followed up the German failures in Champagne with an attack on the Chateau Thierry—Soissons front on the 18th of July, supported by over 500 tanks and with no previous artillery preparation.

Opinions are occasionally expressed that the introduction of the tank in the attacks of 1918 had replaced the action of the artillery by overcoming the hostile obstacles and machine guns. A study of these battles shows that the density of artillery supporting the attack was in no appreciable extent less than in those of 1917. Although the frontage per gun supporting the attacks appear less, it should be remembered that owing to the existing conditions and lack of preliminary bombardment the percentage of guns in action at the moment of the assault was far greater. For instance, in the Passchendaele attack of 1917 only 75% of 18 prs., 65% of 6″ hows., and 35% of 60 prs., were in action at the time of the attack, whereas on the 8th of August at Amiens 98·5% of the allotted strength of artillery was in action on the day of the attack.

In the attack at Hamel 10% of smoke shell had been used in the barrage, but did not prove entirely satisfactory, the general impression being that the smoke had hampered our own powers of observation without compensating advantages. For the Amiens attack a total of 30,000 rounds 18 pr. smoke and 24,000 4·5″ how. had been allowed. Owing to the experience gained at Hamel, and the dry nature of the ground, it was considered that shrapnel shell alone would provide sufficient screening effect. The decision was, however, altered at the last moment owing to heavy rain, and a proportion of smoke shell included in the barrage.

The importance attached to efficient neutralisation of the hostile artillery as a protection to the tanks is exemplified by the allotment of 2/3rds of the available heavy and medium artillery for counter-battery purposes. The use of gas shell was not as extensive as might have been expected, only 10,000 rounds 4·5″ how. and 50,000 rounds 6″ how. being used. The efficiency of the

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neutralisation of the hostile artillery was proved by the fact that in several of the captured batteries the muzzle covers were still on the guns, the personnel intended to man these guns had evidently been either unable or unwilling to take post at their guns.

The following extract from the D.M.S. Fourth Army official report also bears testimony to the efficiency of the neutralisation of the hostile artillery :—"During recent operations on this army front, it has been noticed that there were very few cases of shrapnel wounds among British troops, about 70% being rifle and machine gun bullets and about 27% shell wounds. On the other hand, the wounds among German wounded prisoners show an exceptionally high percentage of shrapnel wounds."

The necessity for elasticity of control in the artillery in attacks of this nature is well exemplified by the methods adopted. During the process of preparation extreme centralisation existed. The army laying down the main outline and restrictions for the deployment of the artillery, and support of the attack, whilst corps controlled the details of these dispositions within their respective spheres. From the moment the attacks started, the process of decentralisation started and the artillery advanced in three echelons :—

(a) One field brigade with each division to furnish direct close support. These brigades crossed the original front line on an average of 1½ hours after the commencement of the operations.

(b) The second echelon consisted of the other field artillery brigade of each division, one 60 pr. battery and one 6″ how. battery. These batteries moved forward directly the final protective barrage had been fired, and remained under the direct orders of the C.R.A's of divisions.

(c) The third echelon comprised the heavy and medium artillery brigades and all army field artillery brigades, these all remained under corps control, ready to be allotted to divisions when and where required.

Throughout the attacks of 1918 we find all belligerents endeavouring to solve the question of close support artillery. However perfect the original plan for the artillery support of the attack, occasions always arose when additional fire power was required at

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short notice to deal with special points of resistance which had escaped the main artillery fire. The true solution to this problem probably lies in the improvement of our methods of intercommunication and the production of a system independent of all wires. As these did not exist we were compelled to place a proportion of our artillery sufficiently close to the attacking troops to ensure the close intercommunication necessary. On August 8th complete batteries were employed, in subsequent attacks sections and single guns were substituted, in each case the same difficulties were encountered, namely that of operating unarmoured artillery within the zone of small arm fire. The problem still remains unsolved for the present, but with recent improvements in wireless telephone and in armoured track vehicles the solution should not be distant.

7. *Allied Offensive of 1918.*

No striking changes in artillery tactics are to be found during the final stage of the war, as represented by the allied general advance. The new tactical methods which we had adopted were producing the results we had been striving for during the past four years. Our enemy was rapidly losing his fighting efficiency and his powers of resistance were deteriorating. The main incentives for further evolution were consequently gone. We only find a few changes in minor artillery tactics, introduced with the object of perfecting our new methods, and adapting them to the more mobile nature of the warfare we found ourselves engaged in.

The most important of these lay in connection with the elasticity in the control of artillery required by the more mobile nature of the operations. Our advance consisted of alternating periods of relatively rapid progress against minor opposition, followed by deliberate attacks against definite lines of resistance. During the mobile periods it was essential to resort to extreme decentralisation in order to provide the necessary liaison between attacking troops and supporting artillery. Corps decentralised a proportion of the medium artillery to divisions, whilst these in their turn allotted a proportion of the divisional artillery to infantry brigades, sections and single guns being finally assigned to battalions. As the enemy succeeded in organising a crust of defensive fire power under cover of the delaying rearguards, the

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mobile phase slowed down, finally necessitating deliberate operations. In order to avoid any unnecessary delay in the staging of these attacks, it was essential that the artillery staffs of all formations should be continually looking forward with the object of determining the next serious line of resistance. This was especially the case in connection with counter-battery staffs. During the mobile phase the C.B. S.O. was unable to control the counter-battery work of the corps, which consequently depended on the individual efforts of divisional artilleries. It was, however, of vital importance for the C.B. S.O. to keep himself in continual touch with the hostile artillery situation, and to regulate the moves of flash spotting and sound ranging sections, so as to admit of co-ordinated counter-battery work being resumed without delay as soon as the hostile resistance stiffened.

Although the majority of the operations carried out during this final phase of the war were based on the tactical methods adopted for the 8th of August attack, yet two operations are worthy of a moment's consideration as they present certain special features. The first case is in connection with the attack of the Hindenburg Line by the Fourth Army on September 26th. This line had never been subjected to any serious bombardment on this portion of the front, and lay for the most part east of the canal, and consequently partially protected from tank attack. It was also known to be very strongly protected by wire entanglements and furnished with strong concrete machine gun emplacements well covered with earth. The situation existing was radically different from that prevailing on August 8th, the general allied offensive was now in progress along the whole of the front, consequently surprise was no longer of paramount importance. The attack was therefore preceded by a 56 hours' bombardment, the first 8 hours consisting of concentrations of gas shell on localities of activity such as headquarters and battery positions. Mustard gas was employed by us for the first time in this bombardment, some 26,000 rds. of 18 pr. and 6000 rds. 4·5″ how. being used. The results, according to prisoners' statements, produced a wide, though not heavy, distribution of gas casualties. The attack on a front of 21,000 yds. was supported by 1050 field guns and 590 heavy guns, giving a density of one field gun to every 21 yds. of front. The point of interest

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to be noted is the fact that the altered circumstances, such as, the general allied offensive, lack of hostile strategical reserves, and offensive operations on the flanks, no longer rendered a strategic surprise of paramount importance; a tactical surprise alone was necessary. Even under these conditions no attempt was made at a systematic destruction of the defences, lanes only were cut through the wire, and main artillery effort was directed towards further reducing the declining moral of the enemy and his power of resistance.

The second case worthy of notice is of interest owing to the example which it affords of the employment of artillery as a means of economising man power in battle. The attack in question was carried out on November 1st, within ten days of the Armistice, by the Canadian Corps in the capture of Valenciennes. The troops engaged in the attack consisted only of the 10th Canadian Infantry Brigade, but owing to the salient formed by the German line at this point, practically the whole of the artillery of the corps was available to support the attack. Although the front of attack was only some 2500 yds., 144 field guns and 104 medium and heavy guns were available to support an infantry brigade reduced to a total strength of some 1500 rifles. The proportion of guns to attacking troops was consequently approximately one gun to every six men, whilst if the weight of ammunition fired be taken into account we find that each infantry soldier was supported by approximately 1½ tons of shell. The circumstances admitting of such a concentration of artillery were no doubt exceptional, but the results achieved certainly justified its employment. The success of the operation can best be judged by examining the following comparative casualties incurred during the operation.

Germans.

Killed (actually buried)	800
Wounded prisoners	75
Unwounded prisoners	1379
Total ...	2254

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Canadian.

Killed	60
Wounded	380
Missing	61
Total ...	501

The facilities for combined enfilade and frontal barrages materially assisted in the efficiency of the artillery fire in this attack. The operation is, however, of special interest in providing a concrete example of the possibilities of economising man power through mechanical means. Guns and ammunition no doubt require time and money for their production, these factors are, however, only trivial when compared with those entailed in the production of the fighting man.

8. *Conclusion.*

In the brief survey of artillery actions of the Great War which we have just completed, an attempt has been made to draw attention to the ever increasing importance of fire power in modern battle. We saw in the first stages a false appreciation as to the required strength of this fire power, secondly a misapplication of the new fire power which we created, and only finally, after many costly errors, did we arrive at a correct method of its employment.

A distinct tendency exists to look upon tactics as only embracing the actual movements of troops in the field of battle. This is probably due to the fact that, as compared to the other arms, the artillery may be considered as still in its infancy. The short ranging days of its childhood have, however, been outgrown. It is now capable of manœuvring its fire power within the field of battle with greater ease and far greater rapidity than any troop movements can be executed. It is with the reserves of artillery fire power that a commander can rapidly influence the course of operations. Should not, therefore, the manœuvre of fire receive equal attention to the manœuvre of troops? In modern war the most perfect tactical handling of troops is liable to failure if the manœuvre of the supporting fire is neglected. In peace we are still able to reproduce and study the effect of the tactical movement

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of troops. Unfortunately the effect of the manœuvre of fire power must remain hidden from us till the next war, and consequently deserves the very closest study from examples in recent history.

The opinion is frequently expressed that the period of static warfare on the western front during the last war presents but few tactical lessons. That the only possible tactical methods consisted of direct frontal attacks, with no flanks, no lines of communications to attack, and no possibility for tactical manœuvre. It is hoped that the very incomplete study of the evolution of artillery during the Great War may assist us in appreciating some of the lessons in the tactical handling of artillery which the Great War provides.

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THE IDEAL ARMY OF THE ARTILLERY CYCLE.

By Colonel J. F. C. Fuller, D.S.O.

Introduction.

IT is a fact which is beyond dispute that military organisation underwent marked changes during the war, and that the armies of 1918 were very different from the armies of 1914. Had the war continued to 1922, the armies of that date would have been still more different; and had it continued to 1926, we may well infer that those of 1926 would have been so different from those of 1914 that the two organisations would be scarcely recognisable.

To-day military organisation still closely resembles that of 1914, consequently, if we bear the above evolution in mind, we may conclude that there is room for improvement. During the war, Necessity, as always, was the mother of invention, demand created supply, and evolution, however haphazard, was rapid, for war is a struggle for existence in which comparatively only the fittest organisations survive. In peace time there is no necessity, there is no tactical struggle, consequently unless evolution is to be excessively slow, we must replace Necessity by Hypothesis, and tactical struggle by logical thinking. We must become rational visionaries.

Since the war much experimental work has been carried out in the greater armies. A number of weapons of war each embodying an idea has been produced, but, as far as I am aware, no attempt has been made to co-ordinate these ideas by establishing a common goal towards which all should converge. What at present is lacking is a key-plan to work to, and without such a plan it may one day be found that it is impossible to organise the inventions introduced during peace time, that is to fit the parts together so that they will produce one co-operative whole.

It is my intention in this paper to outline such a plan, if only in embryo, a plan which though it can be no more than an ideal is sufficiently well-founded tactically and organically to permit of it being applied to the more general conditions which will confront an army in a great war. To examine the special and particular

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conditions which face individual nations is outside the question, yet it must be remembered that, before the ideal can be transformed into the real, these conditions will have to be examined and weighed out.

As in all countries money is insufficient to allow of the constant change which Necessity forces on us during war-time, I have no option but to look well ahead. It is useless laying down what an army should be like in 1930, for when the year 1930 arrives it will have to be changed to what it should be like in 1935, and then later on to 1940, 1945, and so on. We must not however look too far ahead, therefore, I will fix my model at the year 1946. This permits of 20 years to work in, and though it is not possible to see *in detail* what an army of 1946 will, or should, look like, failing some unknown and revolutionary scientific discovery, it is possible to base the ideal model on sound tactical principles, and to do so we must examine very carefully a whole host of changes.

I. Changes in Conditions.

1. The Lessons of the Great War.

All wars are problems of movement, which is tactically gained by protected offensive action. The last great war offers no exception to this rule, for in spite of its static nature it was a prolonged struggle to establish mobility. Movement was its predominating problem, yet, in spite of this, all nations are to-day less well prepared for a war of movement than they were in 1914, since military organisation has not radically changed and yet has become more complex. The 1914 organisation led to static warfare, since fire-power was more than human nature could endure. To-day small arm fire is, generally speaking, three times as great as it was in 1914, yet protective power is about the same, since artillery power has changed but little,[1] and tank power is insignificant. Consequently whatever may be the doctrines laid down in the training manuals, the main tactical problem in a great war remains static warfare.

Since 1914 fire-power has increased, and protective power, which should be the base of fire power, has remained much as

[1] Though great improvements have been made in gun construction since 1918, the number of guns in all great armies has been drastically cut down.

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it was, consequently, tactical mobility is actually less than it was in 1914. The reason for this shortsightedness is that the supreme factor which differentiated the last war from all preceding wars, namely, the petrol engine, has been overlooked. It was not increase in fire-power which enabled the Allied Armies to move forward in 1918, but the increased protective power rendered possible through the high horse-power of the petrol engine. Once half an inch of steel could be carried before the soldier, his fire-power was multiplied many thousands of times, because this half inch of steel reduced the enemy's small arm fire almost to zero. The supreme military mistake of 1919 (one made after each great war in history) was that nations were so blind to the most important lesson of the war—protected mobility—that in place of reorganising their armies according to this lesson they returned to their pre-war organisations.

In the past, military organisation has evolved on the costly system of trial and error, coupled with the omission to disband war-raised units, and tempered by imitating foreign innovations. It has been a grossly inefficient system and extravagantly expensive. In our own history, however, two remarkable exceptions to this blind process of development are to be found, namely, Cromwell's "New Model" and Moore's "Light Brigade." The second had a stupendous influence on our army, and was the most important tactical factor in undermining the power of Napoleon. Once Moore's system was generally established the British Army for five years never suffered defeat.

Moore's system was rational and not blind. It was based on *observed* trial and error, that is on experiment, the aim of which was to explore and develop *a definite idea.* His idea was that of an organisation which could move rapidly and which in movement would be better protected than that of any Continental Power. He built a machine to carry out an idea, and not the parts of a machine from which ideas might or might not be developed. Without this idea his work would have been blind.

2. Changes in Strategical Conditions.

Before reconstruction can be directed along economical lines, the idea which should control the work must first be determined.

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This is not a difficult problem to solve, since a study of history will show that this idea has never radically changed, it is the idea grasped by Moore, or for aught that by Alexander, it is rapid and secure movement in whatever direction is determined on. If an army can move twice as fast as its adversary, and is so strongly protected that it loses but one man to his two, then it will have twice as much time at its disposal, and, in comparison to its enemy's strength, its own will be double its muster role. *Secure movement* should consequently be the tactical pole-star of the military organiser.

Though this idea is fundamental to the maintenance of economy of force, its development into a concrete organisation is dependent on the conditions which surround us. Hitherto strategy and tactics have been in nature linear. Armies have marched by road or have been conveyed by rail, and line has met line on the battlefield. To turn a line or to attack a line in rear has always been a difficult operation. In early days it was possible to do so with cavalry; in recent times only by overlapping, or by the advance of a separate army, consequently large numbers of men were required. The result has been that most attacks have been frontal, and as fire-power has increased these attacks have become so costly, that to-day the infantry assault is almost as rare as the cavalry charge. Concurrently with this increase in fire-power we find army organisation growing more and more complex, not only tactically, but administratively. So much so has this become the case, that fear of exposing the rear services to destruction, not so much through enemy action *as through change of position laterally*, has restricted manœuvre, and has compelled armies to move forward with their fronts at right angles to their communications in order to secure them, and in order to avoid any lateral change in their positions. As manœuvre has been restricted, and as the assault has lost its power, frontal attacks have grown into prolonged operations of attrition in which leadership and command have been replaced by moral endurance and material supply. In the last great war, as long as the enemy's front remained intact, generally speaking his rear remained secure.

To-day this condition no longer holds good, for aircraft can fly over existing armies and attack them in rear; tanks can break their front, and armoured cars can rapidly envelop their flanks and

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attack their rear services—their stomach. We know that these operations are possible since during the last year of the war they were carried out with astonishing success. The rear attack has now become a feasible operation, and will in my opinion become the governing tactical operation in war. What does this mean? It means that in the future, battles will not be fought in more or less rigid lines, but over areas. Fronts may be anywhere, flanks may be anywhere, as at sea, but the rear will remain that point which is closest to the main base of supply—again as in naval warfare. Armies must consequently be organised to attack or protect this point, not by forming a front at right angles to the communications leading to it, for all fronts will be hypothetical until contact takes place, but by possessing "locomobility," that is power to move and to secure movement in any direction over a given area.

Our present idea of mobility must be advanced in degree to cover not only an expanding and contracting area, but also a moving cube, since aircraft can move in three dimensions. At any point in this area, or in this cube, we must possess the power of concentrating superiority of force. It is not so much numbers which will enable us to do this as movement. If an army can move three times as fast as its enemy, then, other things being equal, 20,000 men will defeat 60,000, possibly 160,000. This is the reason why Alexander always defeated the Persians, even when they outnumbered him by twenty to one. His secret was secure mobility, and secure mobility is the mainspring of concentration of force.

3. Changes in Administrative Conditions.

The change over from linear to area strategy will demand radical changes in tactics, and consequently in organisation. Organisation is three-fold: it is tactical, administrative and managerial. Tactical strength depends on fighting power which is based on freedom to supply the combatant portion of the army. The first problem is therefore an administrative one, including bases of supply and lines of communication. There are three main categories of bases, namely, main bases (which in our wars are generally coastal); advanced bases, such as rail-heads; and mobile receiving depots, or field bases, which are in the immediate rear of the fighting troops. In linear warfare the problem is com-

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paratively a simple one; the army moves forward and deploys, and its deployment protects its rear organisation by offering to the enemy a front which must be attacked or circumvented, the last mentioned operation being, as I have shown, an exceedingly difficult one in this type of warfare. In area warfare, comparatively speaking, it is easy, and unless the rear organisation of an army is self-protective and mobile it will offer a tempting objective to an enterprising foe. The rear attack is therefore likely to become *a normal operation of war*, and if it succeed an army may be exterminated before it is able to fire a shot.

The rear attack will and must radically modify our present-day conception of field administration. Main bases[1] must as heretofore remain static, they cannot be moved since factories and harbour accommodation cannot be shifted; they can only be abandoned. In area warfare as a deployed army can no longer guarantee the protection of its advanced base, or bases, these must be self-protective, and as a battle may be fought at any point in the area of war, they must be sufficiently mobile to permit of their positions being shifted so that the freedom of movement of the field army is not restricted. In linear warfare armies have frequently manœuvred in order to protect their bases, in area warfare this operation will be reversed, and the side which can reverse it more fully will possess a tremendous advantage over its antagonist. Whilst main bases must become fixed fortresses, advanced bases must become mobile fortresses. In this last conception there is nothing new, for it is but a return to the mediæval laager which was normally drawn up behind the battle array. As in the case of the laager these advanced bases must not only be able to supply the fighting forces, but must offer them shelter when they require to refit—in fact they may be compared to land "floating-docks."

The supply of these mobile fortresses may be by road, rail, or across country. The lines of communication leading to them may be attacked from any direction, especially if they are static—roads or railways—consequently their supply must be carried out by protected convoys working from the fixed main base. Should the

[1] Main bases may be divided into two categories:—
(a) Coastal bases such as the port of Havre during the war;
(b) Industrial centres, such as the Ruhr or the Bruay coal-fields.

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distance between the main base and the advanced base become too great, intermediary fixed bases, or defended depots, must be established, these forming temporary "land-ports."

The administrative problem is no longer one of peaceful movement behind a protective screen—the field army, for in area warfare administration and tactics are more closely interknit. The administrative troops must not only be able to supply the field army, but protect themselves against air attack and mechanical raids, they must become more and more fighting troops so that the combatant portion of the army may possess freedom of manœuvre.

4. Changes in Tactical Conditions.

The administrative services having been so organised that freedom of manœuvre is possible, the next problem to solve is one of tactics. It is not a new problem, it is an old one in changed form. The enemy must be found; his power to move must be restricted, and finally his power to fight must be destroyed. Thus we get three definite tactical acts—finding, fixing and destroying. To find an enemy demands reconnaissance, and as in area warfare he will not be so intimately tied to fixed lines of communication, this duty will become a more complex one. To fix him, that is to restrict his movement, as heretofore, will demand either clinching with him, or threatening his base of supply, or his lines of communication. Clinching will be much as it has been, but, if the enemy's administrative organisation is mobile, threatening will become more complex, also if his advanced base is threatened, or even besieged, it will frequently be possible for him to improvise or establish another, and so retain his initiative.

In the third act, namely that of destruction, we find a remarkable change. The old method, in nine battles out of ten, resulted in a frontal attack, yet it was clearly recognised that flank attacks were more decisive, and rear attacks more decisive still. The new method will avoid the frontal attack, and will aim at a flank attack supplemented by a rear attack, or when feasible by a rear attack only. Surprise and not numbers will once again become the predominant factor. The destroying force must consequently be extremely mobile, and its mobility will depend quite as much on its power to fix the enemy as on its speed. Further, as it must

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depend for its maintenance on its advanced base, this must be equally mobile, or as mobile as possible. Superiority of mobility and not mass of numbers is the supreme tactical problem of area warfare.

The problem of management, that is command and intercommunication, I will not examine here, for since the general adoption of wireless telegraphy and telephony, area inter-communication has been established. It is no longer necessary to know where a recipient is, for wherever he is he can be communicated with. In management, few radical changes are likely to arise.

5. Changes in Tactical Means.

From the above we see that in area warfare as in linear we get three essential forces, forces which can discover the enemy, forces which can detain him, and forces which can destroy him. In former days these forces were represented by light infantry, infantry and cavalry, each, and more particularly the second, being supported by artillery. The tactical base of light infantry action was the ground itself, for their security mainly lay in skilful use of ground, and in presenting but a small target to the enemy. The tactical base of infantry was artillery, and of cavalry—the infantry and artillery action; the main power of cavalry resting on their mobility, which enabled them to take advantage of opportunities created by the infantry and artillery battle.

In recent years cavalry as the arm of destruction has become almost useless, light infantry have vanished altogether, and battles have become infantry and artillery duels in which superiority of numbers more so than any other factor has become the deciding force. Armies are defeated, but they are seldom destroyed unless they lock themselves up in fortresses, when destruction of a fighting force is attained through surrender. In fact we see during the last hundred years, in spite of the stupendous improvement in weapons, a steady decline in the art of war, until in the Great War it disappears—there is no art, there is only brute force.

To-day the main problem in tactical organisation is to re-establish the essential threefold order of fighting, and the petrol engine enables this to be done, for its power permits of the carriage of armour, and so cancels out the bullet which in recent years has been the chief impediment to movement.

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We start with light infantry, infantry and cavalry as the three essential arms protected by artillery which is common to all three. Therefore, if these are to be placed on a petrol footing, scout machines, assault machines and pursuit machines will be required, each if necessary protected by an artillery machine. I will examine these four categories in turn.

The scout machine should be as small as possible and as fast as possible, which are not altogether compatible qualities. The assault machine should be heavily armoured; without considerable sacrifice of speed it cannot be made proof against armour-piercing shell, but it should carry armour of sufficient thickness to protect it at moderately close ranges from such heavy automatic fire as may be developed from the enemy's scout machines. In my opinion, as time goes on this machine will in nature approximate more and more to the present conception of the artillery machine, until the two may quite possibly coincide. If this takes place, then I think that the present conception of artillery protecting the assault arm (to-day infantry) will be replaced by the older conception of the scout machines protecting the artillery machines which have replaced the assault machines, just as years ago light infantry protected the heavy infantry of the line. This will probably lead to two types of scout machines, namely, the scout machine proper which is used to reconnoitre, and the destroyer machine which is used to protect the artillery assault machines from close attack, much as destroyers protect battleships at sea.

Until such time as the assault machine and the artillery machine coincide, which I believe they will do, since there is little place in a battle between machines for any but light high velocity guns, the artillery machine must be able to destroy the assault machine and to cover its advance.

The pursuit machine should be the fastest machine of all; it should be lightly armoured, should possess a long radius of action, and be self supplying for several days.

From the three tactical essentials of hitting, guarding, and moving may thus be developed three categories of machines, each of one or two classes, namely :—

(i) (a) The scout machine, the duty of which is to reconnoitre (light cavalry).

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(b) The destroyer machine, the duty of which is to protect the assault machines (light infantry).

(ii) (a) The assault machine, the duty of which is to disrupt the enemy's organisation (infantry).

(b) The artillery machine, the duty of which is to protect the assault machine until such time as this machine can develop its own protection (artillery).

(iii) (a) The pursuit machine, the duty of which is to follow up victory by exploitation (cavalry).

(b) The chemical warfare and bridging pursuit machine, the duty of which is to restrict or facilitate movement, in the first case by vesicant and other gas inundations; in the second by bridging (engineers).

Having now considered tactical changes related to means of movement and protective power, for all these machines will be armoured, I will briefly consider weapon power, and here we are confronted by a very interesting problem. Before the outbreak of the Great War three categories of weapons were to be found in all civilised armies, namely, assault weapons (bayonet, lance and sword), in-fighting weapons (rifles and machine guns), and out-fighting weapons (all manner of artillery). During the war a fourth weapon—gas—was added to these. Of all weapons this last one is likely to become the most potent against a muscularly moved army, but against a mechanical army it becomes largely impotent, as the man is shielded against vesicant gases, and, if necessary, a machine such as a tank can be rendered gas-proof. It is for this reason that I do not think that gas will prove a useful weapon against a mechanical target, but dropped from aircraft against non-mechanical targets its effectiveness can scarcely be exaggerated. As regards the *arme blanche*, obviously the bayonet, sword and lance can play no part in the tank battle, and it is equally obvious that the rifle and small-bore machine gun can only play a minor part. We are left, therefore, with artillery *as the principal arm of the future.*

It is curious how history is apt to repeat itself. The general introduction of armour in the fifth century A.D. resulted in infantry playing a very minor role in battle for a thousand years. The reintroduction of armour in the near future, will, so I think, lead

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to a similar result, and as gunpowder introduced the great infantry epoch of war, a period extending from about the middle of the fifteenth century to to-day, so will petrol introduce the great artillery epoch. The superior weapon of the future *is the gun*, the superior soldier *is the gunner*, and the superior army *is a force based on mechanically-propelled artillery*. To-day we stand on the threshold of this third great tactical cycle—the artillery cycle.

If this deduction is a logical one, the next question which confronts us is : What types of cannon will be required in a mechanical army? To-day existing weapons are fitted into newly conceived machines. These weapons were built for a definite purpose, namely, a muscularly moved army, therefore *a priori* we may consider them defective. In the past the main tendencies of gun evolution have been towards greater range, greater weight of shell and greater accuracy and rate of fire. But in the mechanical battles of the future, range will mainly be limited to visibility of target, consequently direct and not indirect laying will be the order of the day. Weight of shell will be limited by the armour piercing effect required, and not by fragmentation and strength of explosion. Accuracy and volume of fire will be all important.

I do not suggest that long range and high calibre artillery will entirely disappear, but I do consider that long range guns and heavy howitzers will play a very secondary role, far more so than to-day. What I do suggest is that in the future guns will definitely be made for tanks and similar weapons, and will be designed to destroy these machines and not primarily to destroy infantry. The future gun is likely to be of comparatively small calibre, but of high velocity and accuracy of fire. In my opinion two main types are likely to be evolved, a cannon superior to but of the nature of the existing 3 and 6 prs., and a heavy machine gun firing a half to a one-inch bullet. The first will constitute the out-fighing, and the second the in-fighting weapon of the ideal army.

6. The Constant Factors.

Thus far I have examined what I believe to be the more important changes which are to-day influencing military organisation, and will, in my opinion, radically change it. This must not blind us, however, to the fact that certain factors remain constant,

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and are likely to remain so. Of these factors the two most important are human nature and ground. The first seldom manifests in its full form except in war, and is consequently overlooked during peace time; the second is more generally recognised, but its relationship to the means of movement we employ, and the possible tactics resulting are overlooked.

Before the last great war most soldiers were always talking of moral qualities until they had suggested to themselves that battles could be won by *moral* alone. Thus hallucinated they stepped on to the battlefields of 1914 only to discover that even the best trained troops in Europe would seldom face modern rifle and machine fire more than once. Human nature could not stand the fire-power of 1914, and the result was static warfare. To-day small arm fire-power has been multiplied three times, yet military organisation is no more self-protective than it was in 1914. To insist that European or other armies are to-day preparing for a war of movement is, in my opinion, incorrect, they are doing nothing of the sort. What they are preparing for, however unconsciously it may be, is to be surprised by the machine gun as they were surprised twelve years ago. They are preparing for a war of slaughter not for a war of movement, and no nation during the next thirty years is likely to tolerate the shambles of 1914, 1915, 1916 and 1917.

Intimately connected with the moral factor is the factor of ground. Ground is a constant condition, or at least one which changes very slowly. The means of moving over it have in the last hundred years radically changed, and these means may roughly be divided into mechanical and non-mechanical categories, consequently ground also should be divided into two categories, ground over which cross-country machines can move freely, and ground which is unsuitable to them. For brief I will call the first "tank areas" and the second "infantry areas."

It is obvious that armies must be prepared to fight over both these areas,[1] and it is also obvious that unless infantry can move at the same pace as tanks, unity of control and action will be most difficult and frequently impossible, unless the speed of the tank

[1] As the infantry areas will normally cover mountainous country or forest land, present ideas on infantry training and tactics will have to be modified. A skilful light infantry will be required in the future, and not the "heavy" infantry we know to-day.

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forces is restricted. It stands to reason, therefore, that to maintain the maximum mobility, such infantry as are required to co-operate with the mechanical forces must be mechanised, that is to say when not fighting they must be carried in cross-country machines. In tank areas infantry are an incumbrance, and in infantry areas tanks are equally so, and as the nature of the ground fought over cannot be changed, consequently organisation must be adapted to fit it. For example: if a General is confronted by a battle in a tank area, one thing he does not want to do is to detach a tank force to protect his infantry units. The infantry must be so organised and equipped that they are self-protective against tanks, they must in fact, be able to form an anti-tank laager. We thus get back to the question of the field base, which should be organised as a mobile fortress, and which should form part of each fighting formation. It should also be organised in two echelons (a) and (b), so that one may remain loaded up whilst the other is away replenishing its supplies. We see, therefore, that these field bases fulfil two purposes, not only do they supply their formation, but they constitute also havens of refuge for either tanks and infantry when not in use, as well as defended harbours for the assembly of such transport as is not required in the battle itself.

From the above the following requirements are arrived at:—

(i) Three main categories of tanks, each in one or two classes.
(ii) The infantry required to accompany a mechanical army must be carried in cross-country vehicles.
(iii) Each main formation must be organised to include a protective mobile field base (in two echelons).

II. Changes in Organisation.

7. General Tactical Organisation.

Having considered the question of means, I will now turn to the problem of tactical organisation, and see how these means can be set together in a co-operative order.

An organisation must possess not only offensive power but protective power, and these two essentials must be so ordered and related that the mobility of the organisation is in no way impaired. Security demands not only tactical liberty which is gained through

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protected offensive action, but uninterrupted and adequate supply. Hitherto the second of these two requirements has generally acted as a brake on the first, but if the supply services can be rendered self-protective, and can be organised to move as rapidly as the combatant troops, then this difficulty will be largely overcome.

I have already examined the question of bases and of advanced bases, and I have also suggested that each main formation such as a division should include a mobile self-protective field base. The possibility of supplying these field bases from the mobile advanced base, and of securely convoying supplies from the main base to the advanced base, and from this base to the field bases will constitute the administrative order from which offensive action will spring. Without this order strategical and tactical stability will be wanting. Hitherto this order has been tied down to roads and railways; in the future, though these means of communication will continue to play an important part, their limitations will be considerably modified by power to move across country, until possibly cross-country movement will become the most important factor in supply.

Turning now to offensive action, which will depend for its freedom on the integrity not only of road and railway communications but on secure movement over entire areas, the tactical requirements are those I have already enumerated, namely, the enemy must be discovered, his movement must be restricted, and finally he must be smashed. These three operations must spring from a protective organisation which by resisting the enemy's pressure can gain freedom of movement for the troops carrying out these three tactical requirements. By power to resist pressure I do not only mean ability to deal blows, but a strength so ordered that the enemy will either refuse attack, or spend much time in manœuvring before attacking.

The stable base of operations, that is the protective order from which offensive action is developed I will call the trunk of the army. To hold an enemy requires at least two tactical arms. These arms should operate from this trunk which should be in close touch with the administrative field base, so that any large hostile force attempting to attack this base will be met by the full resistance of the trunk. To discover the enemy requires a reconnaissance

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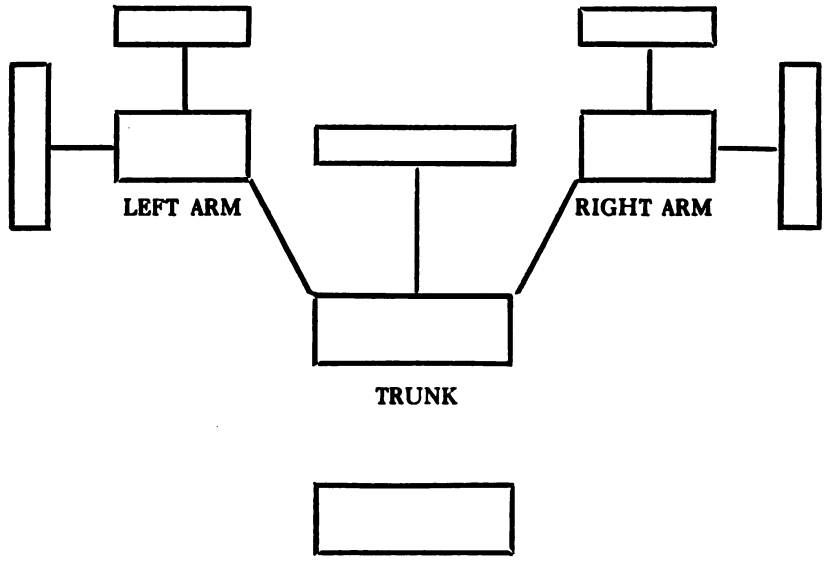
force which obviously must work in the closest co-operation with the trunk and the two arms, and consequently should form part of these organisations. To smash the enemy requires a separate highly mobile force which, when the enemy is held, will strike him in flank or rear. If, however, tactical or geographical conditions prohibit this force manœuvring, then the trunk, protected by its arms must push its way through the enemy and so create an avenue of approach leading towards the enemy's rear services—his vitals. Diagrammatically the tactical organisation suggested may be shown as follows :—



In idea this organisation is a return to the order of battle evolved by Philip of Macedon and Alexander the Great, but possessing more flexibility and endurance for prolonged fighting, as the force which is to deliver the knock-out blow is held in reserve. In the Roman army, which seldom made extensive use of cavalry, the trunk is immensely strong, and is the main instrument of pressure as well as of resistance. In mediæval armies the trunk dwindles into insignificance, and the arms unite and become purely armoured cavalry. In the days of Napoleon a return is made to the classical period, and the French army organisation is largely

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based on the Roman model tempered by extensive use of cavalry to deliver the knock-out blow. Since his day, light and heavy infantry have merged into one arm, and cavalry power has become more and more limited until it has all but disappeared. The influence of these changes on tactical organisation have been radical; armies have lost their mobility and flexibility. The trunk has grown more and more resistant, and less and less able to press an enemy back. The arms have disappeared, and a return has been made to the rigid linear system of the seventeenth century. Light infantry are replaced by cavalry, and infantry are strongly supported by artillery. In fact, by 1914 it was not infantry who prepared the way for cavalry but artillery which prepared the way for infantry, in order to render the infantry assault possible. The assault had in fact replaced the cavalry charge. Then, as the war developed, it was discovered that the assault in its turn had become almost as limited as the charge. It is to this purely linear organisation, namely, a line of guns and a line of riflemen that all armies returned immediately after the war, an organisation as primitive as that of a line of spearmen and a line of bowmen. I have made this digression because it is important to realise how defective existing military organisations are.

As the destruction of the enemy's strength is the aim of battle, so also is the occupation of the enemy's country the aim of war, so that a condition of non-resistance may be established which will permit of political action taking effect. As the occupation of a country is mainly police duty, numbers of men rather than strength of fighting power are required. These men should be organised into a separate force, for if they are added to the field army they must seriously detract from its mobility. Their use is after the battle not during it, in fact on the battlefield they can only prove a serious encumbrance.

I will now chart out the whole of this ideal organisation diagrammatically:—

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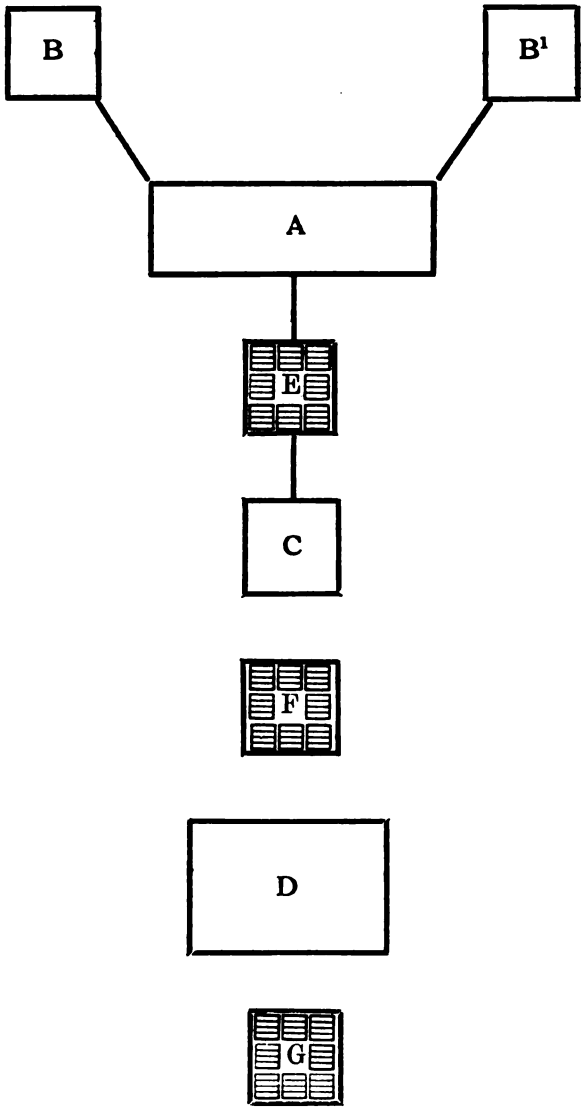

A is the trunk of the field army, and B, B^1 are its two tactical arms, all three possessing their own reconnaissance services. On the outbreak of war, B and B^1 move rapidly forward and search for the enemy, or occupy positions which are of importance to him. Once they discover him, they restrict his movements in order to gain time for A to clinch with him. Once A obtains a firm hold, C moves forward and attacks the enemy in flank or rear; or if the enemy is already broken, pursues. If B and B^1 are driven back,

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A protects them, and if necessary C counter-attacks. Once the enemy's field army is destroyed, D occupies the conquered country. So much for the tactics of this organisation, now as to its supply services.

E is what I have called the field base, or formation laager,[1] it supplies A, B, B^1 and C, and is protected against any operation other than a raid by the close proximity of these forces. It is supplied from the advanced base F which is a mobile fortress; supplies being convoyed from F to E. F is similarly supplied from the main base G, which is a static fortress. D can find security in G until required. Such, in brief, I believe, is the organisation suitable for area warfare. I will now in some detail examine each part of this organisation.

8. The Organisation of Supply.

Accepting the above organisation as a hypothetical model, I will first examine its system of supply, for on it depends to a large extent the freedom of movement of the field army.

To start with the main base—G on the diagram. It must, as I have already said, be static, in fact on its stability will to a considerable extent depend the smooth working of the administrative services which is so essential to the tactical mobility of the field army.

If it is a coastal base, its utility obviously depends on the security of the sea communications connecting it with the home base, if an industrial area, then on protection of certain land communications. These being safeguarded, the problem becomes one of protection against land and air attack. As long as the field army remains undefeated, a heavy attack upon it is a most unlikely contingency, but it must be protected against armoured cars and possibly tank raids. It should be surrounded, therefore, by an anti-tank moat and protected by mine-fields. It should also possess a small mobile column, which can make sorties against any raider.

Its security against air attack is its main protective problem. It must be equipped with the most scientifically organised ground defences, however static and delicate may be their nature, and it

[1] For simplicity I have shown it as one unit. Normally one of the echelons (a) or (b) of the field bases will be assembled at a central refilling point, which in the diagram may be considered to be at E.

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must possess one or more aerodromes, a series of out-lying landing grounds, and a strong force of aircraft.

Once its protection is guaranteed, the next problem is the safe replenishment of the advanced bases. Though these organisations are mobile and can move across country, it must not be supposed that railways and roads will not be used. They will be used to their full extent, and their vital points—bridges, junctions, tunnels, etc.—will have to be protected. But to supplement their powers, cross-country supply columns must be provided, and these I consider should be moved by powerful tractors hauling from 25 to 100 tons across country in tracked supply vehicles. These columns must be convoyed by tanks of the destroyer class.

The advanced base, as I have already stated, must be mobile, it must be able to shift its position, for though, when possible, it will occupy a road or rail centre, it will not always be able to do so, since in area warfare it may at any moment be attacked from any direction. In order that its mobility may be of a high order, its supplies and its workshops, etc., must be able to move at short notice. This means that the minimum of dumping will take place, the bulk of the supplies and workshops must therefore be kept on tracks.

Its protection must be more mobile than the main base. Though trenches may be dug and mine-fields laid, its chief land defence must depend on power to hit out hard, as well as to guard. Its air defence must be equally mobile, consequently it must possess its own force of aeroplanes, and as its gun defence cannot be so delicate and complex as that of the coastal base, I consider that a self-propelled gun equipped with special sights will be the most suitable weapon.

The supplies it receives from the main base will be kept on tracks, and when required by the field army will be sent to it either by road or across country.

I now come to E, the field base, which receives supplies from F, and distributes them to the formations. It is an integral part of the field army which largely protects it—its local protection must be provided by itself.

When the whole army is assembled and is in close contact, the supply of its parts should provide no great difficulty, nor should

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the difficulty be great once the enemy is defeated, for defeat precludes tactical operations other than rearguard and flankguard raids. The main difficulties of supply will I think occur before contact is gained, and whilst the army is manœuvring for a clinch. When the wings B and B^1 are searching for the enemy, or when at a distance from A and C they are attempting to hold him, or restrict his power of manœuvre, the endurance of their pressure and resistance will depend on their maintenance. How long they can live on their own fat will depend on the size of their integral supply units. If a high mobility is to be maintained these must be small, and the smaller they are the more frequently must they be replenished. This replenishment should, I consider, be done not by comparatively slow-moving cross-country trains as suggested for the supply of F and E, but by more rapidly moving cross-country lorries, these again will have to be escorted.

To summarise what I have now written. The whole supply organisation springs from the static main base G. From G to F, the advanced base, road, rail and cross-country trains will be used, and from F to E cross-country trains will be mainly depended on. From E to the formations themselves cross-country lorries will be the transport used. All columns will normally have to be convoyed by fighting machines, and the types which suggest themselves as most suitable for this purpose are the scout and destroyer classes.

9. The Organisation of the Heavy Divisions.

The trunk A must possess great resisting power so as to enable the wings B and B^1 to maintain their mobility. As normally great battles take place in moderately open country, this trunk in the main must be a mechanical force; but as it may at times be called upon to fight in infantry areas, it must also include infantry. I will suppose that it is composed of heavy divisions each of two brigades.

A heavy brigade must be able to carry out its own reconnaissance, therefore I will allot to it a battalion of scout tanks, or a battalion of armoured cars.[1] For its resisting power I will allot to it one battalion of assault machines. These are its capital ships,

[1] I am of opinion that eventually the present armoured car will be replaced by a tracked or semi-tracked machine.

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and as they are never likely to exist in great numbers, they should be protected by two battalions of destroyer tanks. To increase the resisting power of this force I will allot to the division two brigades of self-propelled guns. Such I visualise will be its main mechanical arms.

To assist it in reconnaissance, and to protect it from air attack, the division will require at least two squadrons of aeroplanes. Further if cavalry can be so equipped that they can average fifty miles a day for three or four days on end, they will still prove not only useful for local reconnaissance, but most valuable for purposes of communication, traffic control, and police work.

As the infantry will be required to move with the heavy divisions they must be carried in cross-country machines. In open country they are useless, and in mountainous country the tanks are almost equally so; but if a new type of soldier namely, a tank-infantryman[1] were to be created, then this difficulty would in part be overcome. What I suggest is that every tank (and armoured car) soldier should not only be trained as a tank driver and gunner but also as a light infantryman. If, for example, a tank battalion consists of 40 tanks, and each machine requires a crew of five men, then I suggest that each machine be allotted four crews. One of these crews would be in the machine, and three in cross-country vehicles, All the men would be trained to fight in a tank, or to fight as light infantry. The maximum fighting power would therefore be 40 tanks and 600 light infantry, or, if the tanks cannot be used, then about 700 light infantry, as about 100 would be required as "tank-holders." Not only would this organisation enable both types of ground to be fought over by the same soldier, but would provide the tanks with three reserve crews apiece, a most important reserve, since in war, though it should not be difficult to replace machines, it will always be difficult to train a reserve of tank drivers and gunners.

The strength of a heavy brigade may very roughly be calculated as follows:—

[1] This was done in our own army during the war, for all tank crews were trained to fight as Lewis Gunners in the open.

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Units.	No. of Machines.	Strength of each crew.	Strength of crews.	Strength of spare crews.	Unit Administrative personnel.	Cross-country vehicles.	Supply vehicles.
1 Bn. Scout Ts.	40	3	120	600	180	52	15
1 Bn. Assault Ts.	40	7	280	560	210	52	20
2 Bns. Destroyer Ts.	80	5	400	1200	400	108	30
	160	—	800	2360	790	212	65

The totals for the tank-infantry portion are therefore 160 tanks, 277 cross-country vehicles, and 3950 officers and men, or 7900 for the division. Adding 1100 officers and men for the two brigades of artillery, the cavalry regiment and the two squadrons of aeroplanes we get a total of 9000, which probably will rise to about 10,000 when sappers, signallers and special troops for the local protection of the divisional field base are added. Add to this forty per cent. for administrative services and convoy troops, and the total personnel strength of a heavy division will be about 14,000 officers and men.

The heavy division as we see is divided into two categories of troops, those who can fight in tank areas, and those who can fight in infantry areas. Whichever area is met with the troops not required to fight in it will be relegated to the field base E, and when both areas are simultaneously met with this base will not only protect itself but will be protected by force C until this force is required to carry out the decisive attack on the enemy's flanks or rear.

10. The Organisation of the Light Divisions.

I will now turn from the composition of the heavy division to that of the light division, one or more of which should form the tactical arms, or wings of the central trunk. Its mobility should be considerably higher than that of the heavy divisions, and this mobility should be gained not so much by building faster machines, but by so organising this formation that it possesses little impedi-

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menta. To gain this mobility the organisation of the light division must be entirely mechanical. Cavalry can form no part of this organisation during the highly mobile phases of a war, and if, when the slower phases set in, it is considered that cavalry will prove useful, then I am of opinion that they should be held in reserve at D or F until these phases develop.

Without infantry these wings will not be able to operate freely through infantry areas. This limitation must be accepted, for to encumber this formation with a large number of cross-country vehicles would detract from its mobility. If these areas are met with and are occupied by the enemy, then the light divisions must either hold the enemy until the heavy division can approach, or else through their high mobility they must circumvent these areas and cut their garrisons off from their base.

Each light division I suggest should consist of two brigades, each consisting of:—

Units.	No. of Machines.	Strength of each crew.	Strength of crews.	Strength of spare crews.	Unit Administrative personnel.	Cross-country vehicles.	Supply vehicles.
1 Bn. Scout Ts.	40	3	120	120	60	12	10
3 Bns. Destroyer Ts.	120	5	600	600	300	60	45
	160	—	720	720	360	72	55

This gives a total of 160 tanks, 127 cross-country vehicles and 1800 officers and men. For the combatant part of the light division this number must be doubled—3600—and brought up to 4000 to include sappers and signallers. Adding to this forty per cent. for administrative services we obtain the grand total of 5600 officers and men for each light division.

The spare crews should not, so I consider, be trained to fight as light infantry, but in place to protect the administrative units against tank and infantry attack.

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11. The Organisation of the Pursuit Divisions.

The force destined to deliver the knock-out blow should consist of one or more pursuit divisions, each consisting of two brigades, each of three battalions of pursuit machines. No other machines should be allotted to these brigades otherwise mobility will suffer, therefore the reconnaissance requirements of a pursuit brigade should be carried out by aircraft. The establishment of a pursuit battalion might be as follows:—

Unit.	No. of machines.	Strength of each crew.	Strength of crews.	Strength of spare crews.	Unit Administrative personnel.	Cross-country vehicles.	Supply vehicles.
1 Bn. Pursuit Ts.	40	7	280	280	140	28	20

For each brigade this would make 120 tanks, 144 cross-country vehicles, and 2100 officers and men, or for a pursuit division 4200 officers and men, or with sappers and signallers about 5000.

When in action, it is important that the six pursuit battalions of these divisions should be entirely freed from the responsibility of protecting their administrative services, yet it is equally important that these should be protected. I suggest, therefore, that each pursuit division be allotted one destroyer battalion for this purpose, strength in personnel 500, and a chemical warfare and bridging battalion, which will bring the combatant strength of the division up to 6000. Add to this forty per cent. for administrative personnel, and the total strength will be 8400.

12. The Organisation of the Army of Occupation.

Thus far I have only considered that part of an army which can destroy the enemy's strength, and break down military opposition. But victory in itself is only a means towards an end, the end being political action. To guarantee that this action may become effective, it is not only necessary to destroy the enemy's military strength, but to occupy his country, and establish a condition of tranquillity which will enable political action to take effect. In recent times this occupation has been carried out by the fighting

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troops themselves, since numbers of men were required for this purpose, and infantry were as cheap as a special police force. When armies become mechanised, this condition will change. First, mechanical armies will be comparatively small, secondly they will not be well suited for this work, and thirdly it will be extravagant to use them for it. I am of opinion, therefore, that in wars which demand occupation, as most wars do, for occupation of an area to a large degree guarantees its security as a tactical base of operations, the mechanical forces will have to be followed by a police force. This force I am of opinion will be largely composed of the arms we know to-day, namely, cavalry, artillery and infantry. Certain modification will undoubtedly be introduced, such as bus columns and anti-tank units; but changes are unlikely to be radical since occupation and police work demand not so much the coercion of the enemy's civil population as their control. This control can best be gained by freely moving amongst them.

This army of occupation may also be called upon to carry out another duty, namely, the reinforcement of the infantry of the mechanical army should extensive mountain warfare or forest-fighting become necessary.

13. The Ideal Army in 1946.

Though it is impossible to visualise in detail what an army will look like twenty years hence, it is possible, as I have attempted to do, to consider the defects of existing army organisation; to examine existing tendencies, and by projecting these into the future to build up a hypothetical model. If this model is based on sound principles, the probabilities are that though the armies of 1946 will in detail largely differ from the ideal, in principle the differences will not be radical.[1] We must remember that unless we have clearly in our heads an idea of what we want, not only must progress be extremely slow, but its cost extravagantly high. Before painting a picture an artist must have in his head an idea of what he wants to paint. He converts this idea into a sketch, and eventually elaborates this sketch into a picture. If we are to work on rational lines our process must be identical.

[1] Assuming always that they are willing to change.

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I have now outlined a sketch, rough though it be. I have started by proving, at least I hope I have, that to-day we are confronted by a new military conception, namely, area warfare, consequently existing tactics must be changed to fit it, and consequently military organisation must be changed in order to express these tactics.

In war the essential is to defeat the enemy with the least possible all round loss. In peace time the essential is efficiency. Sometimes efficiency has demanded a small army, sometimes a large. In the cavalry cycle of war (400—1400 A.D.) armies were frequently microscopic in size, because no nation could recruit or pay for thousands of armoured cavalry. During the infantry cycle (1450—to-day) armies grew and grew in size until numbers swamped efficiency, and in the last war, we see a return to the horde armies of ancient Assyria and Persia.

To-day, in the artillery cycle, we are going, so I believe, to return to efficiency and to comparatively small armies, and for very similar economic reasons as those which governed the cavalry cycle. Directly we can free our minds from the spell of numerical superiority, that God marches with the big battalions, shall we realise this. The army of the future will follow in the footsteps of the navy of to-day. Once a maritime nation could build scores and hundreds of galleys; to-day many seafaring powers cannot afford half a dozen capital ships, even in the Great War we only possessed between twenty and thirty.[1]

My conception of the ideal army of 1946 is as follows:—

(i) Two heavy divisions, strength approximately 28,000 officers and men.

(ii) Two light divisions, strength approximately 12,000 officers and men.

(iii) Two pursuit divisions, strength approximately 17,000 officers and men.

In round numbers the strength of such an army will be 2000 fighting machines[2] and 60,000 all ranks. A microscopic force

[1] Galley fighting was sea "infantry" warfare; capital ship fighting is sea "artillery" warfare. To-day, the same process of change is at work in armies as formerly was the case in navies.

[2] The cost of such a force may perplex some readers. It is not however prohibitive. If *on an average* each machine costs £10,000 (a high figure), the capital cost will be £20,000,000; and if the life of a machine is reckoned at ten years, the yearly production cost will be £2,000,000.

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when compared to the horde armies of 1914-1918. Yet, though during the last year of the war we used up as many tanks as the number I have just quoted, can it be doubted that if the *organised* force of my sketch had existed, we could not have decimated these hordes as surely as Alexander decimated the Persians at Issus and at Arbela?

Finally, in my opinion, the artillery, or mechanical, cycle of war will reintroduce the highly professional army, and conscription will be relegated to the troops of the second line, the militia which will occupy the enemy's country after his mechanical forces have been defeated, driven back, or destroyed.

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YPRES.

The Story of a Thousand Years[1]

By Major A. F. Becke, late R.F.A.

Part I. The first five centuries, 900—1400.

(With 2 plans.)

THE story of Ypres is a romance, and a romance, too, that not only covers ten centuries of time, but also enshrines a pageant of a city's life: its steady, healthy growth, its achievement of municipal administration, its embellishment with an unrivalled architectural splendour, its protection by renowned fortifications, and its decay. But while its commerce flourished and its industries prospered, the even flow of its life was often disturbed by civil strife, religious zeal and persecutions, by great battles and by famous sieges, until at long last the ancient city was blasted with a three years tempest of iron.

Its mouldering walls and shell-scarred bastions now enclosed the shattered ruins of its rich and splendid buildings, its noble *Halles*,[2] and venerable churches; and all that remained of its towering belfry was a mere splintered fragment pointing dumbly to the sky, ghostly relics of crumbling greatness.

This in brief, is the story that is to be unfolded of the bygone pride and ornament of Western Flanders. Few places have grown so great and beautiful, and fewer still have fallen so low as Ypres.

Note.—I particularly wish to express my gratitude to Major A. H. Thomas, late, The Lancashire Fusiliers, and now Clerk of the Records of the City of London, for having very kindly read this article for me and for making many valuable suggestions.

[1] The chief authority for this narrative, as well as for the two plans, is *L'Histoire militaire de la ville d'Ypres* by J. J. J. Vereecke. This book, with its accompanying atlas of 37 maps and plates, was published at Ghent in 1858, and is based on old printed accounts and on original documents in the archives then preserved at Ypres. The book and its atlas are rare and difficult to obtain, and even the British Museum library does not appear to possess a copy. At the end of the book are given the names of the 150 original subscribers to the work, who took between them 350 copies.

[2] The Cloth Hall of the British maps.

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Ypres was the former capital of Western Flanders, a territory composed of the overlordships [*Châtellenies*] of Ypres, Bailleul, Cassel, Bourbourg (on either side of the river Aa from Watten to Gravelines), Bergues St. Winoc (from the Upper Yser past Bergues to Dunkirk), and Furnes. In ancient times the old city was always regarded as one of the main bulwarks in the defence of the country, for which reason it was strongly fortified and in consequence sustained numerous sieges. Perhaps no town has undergone more changes than Ypres. At one time small and insignificant, it gradually grew rich and powerful, and became well, and in the end even elaborately, fortified. Then conditions changed and its works were allowed to fall into decay and ruin; but this was not the end, for these ravages of time were followed by restoration, and Ypres once more assumed its position as an important fortress, until in 1852 the place was declared obsolete and finally dismantled.[1] Its trade had long since passed away, and for years after its degradation the place merely existed, dreaming of its past greatness, when in 1914 there came a sudden final awakening, followed as swiftly by ruin absolute and complete.[2]

The story of Ypres, therefore, is well worth telling for itself, but when we recall that since the earliest times our own history on many occasions has been associated with the place, then the tale is indeed worth recounting.

EARLY TIMES.

In Roman times the towns then existing in the vicinity of what afterwards became the site of Ypres, were Wervicq *(Viraviacum)* on the Lys, lying to the south-eastward, and Cassel *(Castellum Morinorum)*[3] to the westward. One of the six Roman roads that radiated from Bavai *(Bagacum)* ran via Tournai *(Tornacum)* and Wervicq to Cassel, passing midway between the present sites of the ruins of Ypres and Messines.[4] From Cassel this road ran on to

[1] At the same time the fortifications at Menin, Ath, Philipeville, and Mariembourg were also dispensed with.

[2] With the reborn Ypres this narrative naturally has nothing to do.

[3] *Castellum Menapiorum* was apparently the Roman name for Kessel (on the Moselle).

[4] Another of these Roman roads starting from Bavai, was the Brunhild Way that ran past the battlefields of Fleurus (1690) and of Ligny (1815). This road went on to *Colonia Agrippina* (Cologne).

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Boulogne *(Gesoriacum)*. But in Roman times, excepting for this one route, the district was without any military communications and was covered with dense forests and impassable marshes.

It is extremely difficult to disentangle from the accretion of legends exactly what was the genesis of the ancient city of Ypres. It seems probable, however, that the first authentic building on this site was erected during the first decade of the Xth Century, when, in 902, Baldwin the Bold, the second Count of Flanders,[1] built a *château* on the Yperlée. This house was placed on the northern end of a small island, and communicated with the left bank by a bridge that spanned the western branch of the stream. In plan the *château* was triangular, and was flanked at each corner by a tower, whence it was named suitably enough *Château à trois tours.*[2] Naturally it was not long before retainers and others came and settled down under the protection of their Count and built themselves dwellings on the island in the Yperlée. This was probably the real origin of the town of Ypres.[3]

The First Defences.

Soon the population grew, and the buildings then spread from the island to the right bank of the eastern branch of the river. The ground here had to be cleared, for at that epoch it was covered with trees, and on both banks of the Yperlée to the southward lay extensive swamps. This growing collection of houses on the mainland lay open and defenceless and invited a raid; consequently in 920, to cover the village that had sprung up, Arnulf, Count of Flanders (son of Baldwin), had Ypres[4] put in a state of defence for the first time.

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[1] Baldwin the IInd married a daughter of Alfred the Great of England. He died in 918.

[2] It must not be confused with the modern house, the *Château des Trois Tours*, that was situated about half a mile to the west of Brielen and 2¼ miles north-west of the site of Baldwin's original building.

During the Battles of Ypres, 1915, Canadian Divisional Headquarters used the *Château des Trois Tours.*

[3] In 1914 the site of the ancient *Château à trois tours* was inside the town of Ypres, and lay about eighty yards to the west of St. Martin's Cathedral. Although in later times the Yperlée ran underground within the city itself (like the *Rivière des Layes* at Armentières), yet even as late as the XVIIth Century it ran through the town, passing to the westward of the *Halles* and St. Martin's.

[4] The Town on the Yperlée.

Ancient maps show that the old course of the Yperlée was as follows:— rising near Wulverghem it ran past Voormezeele, Ypres, and Knocke where it joined the Yser, and the joint stream then flowed on past Dixmude, as it does now, to the sea near Nieuport.

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Arnulf caused the place to be enclosed by an earthen rampart, or parapet, with a ditch beyond it,[1] which covered the northern, eastern, and southern sides, whilst the western flank was secured by the Yperlée itself and the *château*. The defencible enceinte was pierced by three gates: by the north gate, leading to Thourout, by the south gate, leading to Messines, whilst the original passage from the *château* across to the western bank of the river went by the name of the Meadow Gate.

But still the place grew, and in 958 Count Baldwin the IIIrd was forced to allow it to expand on to the main left bank of the river. As an immediate result of this the *Château à trois tours* became enclosed within the town itself and thus ceased to play any useful part in the outer defences of Ypres. It was not until about 965 that this expansion was completed, and then the shape of the town was entirely changed, and it now approximated in contour to what it was in August 1914 (see Plan 1).

The Gateways.

The number of gates had by now been increased to six. On the north face were three: Boesinghe, Dixmude (still in existence in 1914), and Thourout. The Antwerp gate was on the eastern side, the Messines Gate (in later times called the Lille Gate) was on the southern, and on the western was the Temple Gate. Later on the last-named was replaced by the gate through which the road to Bailleul leaves Ypres.

The Porte d'Anvers, or Antwerp Gate, known to so many officers and men under its modern name of Menin Gate, requires especial mention. The original name of this ancient sally-port was probably Hangoart-poort.[2] But the pronunciation of this hideous

[1] Ypres was not surrounded by walls at this time. Even during the famous siege of 1383 the defence was still an earthen rampart, and the only masonry in it was that used for the construction of the gates with which the parapet was pierced.

Only three Flemish fortresses in the Xth Century were defended by stone walls. Baldwin *Bras de Fer*, the first Count of Flanders, had thus strengthened Bruges (covering the approach from the sea), Ghent (on the Lorraine frontier, covering the passages across the Schelde), and Arras (on the southern side, facing France).

Baldwin the 1st had married a daughter of Charles the Bold (King of Neustria and Burgundy), and from him held Flanders as an hereditary fief.

[2] The origin of Hangoart-poort is uncertain. In the XIIIth Century there was then domiciled at Lille a noble Flemish family called Hangouart. Possibly in earlier times an ancestor had owned a house in Ypres near this gate, and belonging to a family of distinction, he gave his name to the gate. However this may be, the road outside the gate was called the Hangoart-Straat (but this latter was not coincident with the modern Menin Road, but lay just to the southward of its alignment).

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name was too difficult, and in the Yprois dialect it was soon corrupted to the easier form of Hanwerpoort. Possible Porte d'Anvers was derived from this debased form, and by 1640 it was in common use. The name Menin Gate does not appear on maps before 1815.

In 1075 Robert the Frisian, who had by then become undisputed Count of Flanders, built in Ypres the Church of St. Peter, near the Messines Gate.[1] This was one of the thirty churches that Robert had vowed to build or restore as a thank-offering for his victory over Philip the 1st, King of France, on the 22nd February 1071 near Cassel.

The First Siege.

Ypres was soon to receive its *baptême de feu*, for in 1127 it sustained its first serious siege. On the 25th May Louis the VIth, King of France, invested the place. His troops repulsed a sortie that was made by the garrison in the direction of Vlamertinghe, but otherwise little success was achieved by the besieging force. Treachery, however, brought about the fall of the town, for local sympathisers with the French sold the South, or Messines, Gate and an entry was effected at this point. Meanwhile Louis pressed home an attack and the place fell. But even then for some time the Castellan [*châtelain*] of Ypres, William of Ypres (or Loo),[2] and three hundred of the garrison stoutly maintained themselves on the northern ramparts near the Thourout Gate, until finally forced back from this position they were eventually rounded up and secured. The city was then at once given over to pillage and the inhabitants were disarmed.

Louis after a short time released the Castellan, and William of Ypres then crossed over to England and fought for King Stephen, who rewarded him with revenues drawn from the crown lands in Kent.[3] William finally returned to Flanders and died at Loo[4] in 1163.

[1] By 1914 the original church had been largely rebuilt.

[2] William of Ypres, son of the Count of Ypres (a younger son of Robert of Flanders) had claimed the Flemish succession. Another candidate, however, had been put forward by Louis of France who supported his nominee with his army, and as narrated above captured William at Ypres.

[3] Whilst Warden of Rye, William built the tower now known as the Ypres Tower.

[4] Ten miles north-north-west of Ypres.

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Plan 1.

Ypres itself was still expanding and it continued to do so on the western bank of the Yperlée. More gates had to be pierced in the new enceinte. On the western face was constructed the appropriately named Butter Gate which led very suitably to the Boter Plas. At the north-western angle was the new Elverdinghe gate, and a postern, the Steendampoort, was pierced in the northern side.

At the same time the defences were overhauled and improved: the moat was deepened, the earthen rampart was strengthened, and wooden towers were also placed on it, probably not with the idea of providing flanking defence, but to assist in limiting and controlling any lodgment that might be effected by an assailant on the banquette. Each tower, too, was a separate fort to be carried only after a costly escalade, unless it could be burned by the assailant. At the same time thorn hedges were planted on the ramparts, and thus came into existence the celebrated *Tuinen*,[1] which covered and enclosed the place for so many years.

Meanwhile in 1168, Count Philip of Alsace began the erection of a town house, that was afterwards used as their official residence by several Counts of Flanders. The site of the new building, called locally the Count's Hall,[2] was on a small islet, and it was surrounded by large wet ditches fed by the waters of the Yperlée. Like all buildings of the period it had towers and the battlements were crenellated, though it was not intended to form part of the real defences of the place. During the XVth and XVIth centuries it became the seat of administration for the overlordship of Ypres, until in about 1550 a new court was built for this purpose in the Grande Place. The Count's Hall finally degenerated into a military prison, its ditches were gradually filled in, and by 1838 all traces of this venerable building had vanished. Its erection, however, had one important result—the old *Château à trois tours* was finally abandoned by the Counts, and, falling into decay, this earliest Yprois building gradually disappeared and its site was built over.[3]

[1] Enclosures, gardens, the French equivalent probably would be *clôtures*.

[2] *Zael hof*. Its site was about 250 yards to the west of St. Peter's Church.

[3] This appears to have occurred before the middle of the XIIIth century.

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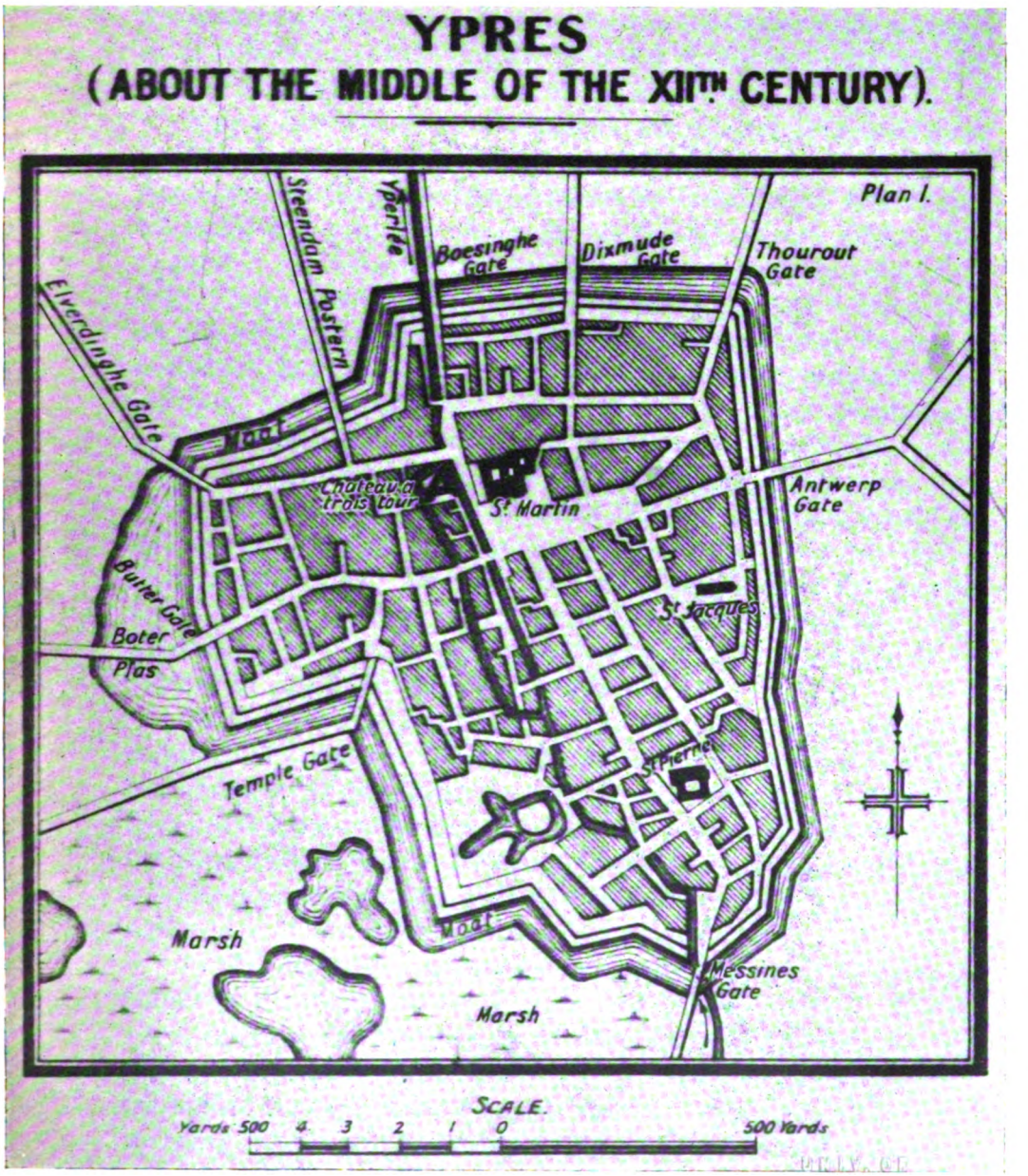

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THE SECOND SIEGE.

In 1179 the overlordship of Ypres was precisely defined and thirty-three parishes were placed under the Castellan. This arrangement persisted until the overlordship was abolished in 1794, at the time of the French occupation of the country.

Ypres itself became embroiled in the quarrel between Count Ferdinand of Portugal and his uncle the French King, Philip Augustus, and the latter having seized St. Omer, Aire, and Cassel, advanced and surprised the town on the 8th March 1214. The siege, if it can be so called, lasted only a few days and the place fell. Philip Augustus disarmed the people, imposed a heavy fine on the town, and sent the principal inhabitants into France as hostages. After the French evacuated the place the ramparts were repaired and the defences once more thoroughly overhauled. Philip Augustus in the peace that he imposed included the conditions that the defences of Valenciennes, Ypres, Audenarde, and Cassel were to be levelled, no other Flemish fortresses should be strengthened, and no new ones constructed without the permission of the French King. But so far as Ypres was concerned this proviso seems to have been ignored. In 1229, however, Louis the IXth, then King of France, gave permission to Count Ferdinand to rebuild in stone the gates of his towns.

In the second half of the XIIIth century the outskirts (or suburbs) of Ypres were marked by ten stones[1] so as to make clear the boundary of the jurisdiction of the chief magistrate of Ypres. The interest lies in the fact that the records show that at this time no gates existed where the roads crossed the extremity of the suburbs, nor at this time were any defences thrown up along the outer edge of the delimited area.

In 1297 raged the unfortunate war between Guy of Dampierre, Count of Flanders, and the French king, Philip the Fair. Count Guy, realising the importance of friendly relations between the Flemish weavers and England, the great wool-producing country, had allied himself with Edward the 1st. Philip retaliated by invading Flanders; and after reducing Lille, which offered a stubborn resistance, he occupied Furnes, Bergues St. Winoc, and

[1] No. 2 stone stood to the south of the town, on the road to Kemmel close to the inn called Withuis (white house) shown on the British maps of the Ypres salient.

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Cassel, and laid siege to Ypres. Once again the town fell, and it was pillaged and part of it burnt. This invasion was followed by a French occupation of Flanders. In 1302, however, the Flemings rose against their French oppressors, and Guy of Namur retook Ypres, when the fortifications of the city were at once repaired.

THE BATTLE OF THE GOLDEN SPURS,[1] AND THE FORMATION OF THE SOCIETY OF ST. SEBASTIAN.

In July of the same year, in the valley of the Lys under the walls of Courtrai, the Flemish infantry under Guy, occupying a well-selected position, routed the French army under Count Robert of Artois. Count Robert had with him 7,000 of the chivalry of Picardy, Normandy, Artois, and Lorraine. The Count, holding his enemy in contempt, made an ill-judged effort to find a short cut to victory by pushing forward his heavy cavalry in a downpour of rain over most unsuitable ground. No doubt here his frame of mind and contempt for his foe were represented by an aphorism that he once uttered: "one hundred mounted men-at-arms are worth a thousand infantry." At this epoch under suitable conditions this was probably true enough, but at Courtrai the ground, natural obstacles, and the weather were all against the employment of heavy mailed cavalry, and the cross-bow and pike in the hands of sturdy, well-placed infantry gained a hard-fought day.

The Yprois, after ensuring adequate protection for their own city, had been able to send to the Flemish army a contingent of 1200 men—500 being footmen dressed in red, and 700 crossbowmen in black. But this detachment was not engaged in the actual battle, being used to garrison Courtrai and to invest the keep, which was still occupied by the enemy, and to neutralise its garrison. While the battle was raging the Yprois drove back a sortie that was attempted with the view of making a diversion. But handled as the French Army was only a miracle could have brought about a French victory on that day. Two days later the Keep surrendered. To commemorate the Flemish victory at Courtrai the Yprois in 1303 founded a society of archers of St. Sebastian. This ancient

[1] Known as the battle of the Golden Spurs, from the fact that many golden spurs (probably about 700, but some writers even say 4,000) hacked from the heels of the dead French Knights and Nobles, were afterwards hung up in Courtrai Cathedral. The Count of Artois himself was slain in the battle.

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society was still flourishing in the middle of the XIXth century, and thus kept green the memory of a great day.

In the further fighting that took place during this war a contingent from Ypres, 800 strong, took part in April 1303 in the battle of Arques, near St. Omer, which resulted in a defeat for the Flemish. The Yprois seized and burned the *château* of Arques, but pushing on they became heavily engaged and lost 600 men. When peace was concluded after the battle, the 200 survivors founded the society of Ste. Barbe Crossbowmen. This society lasted until the last decade of the XVIIIth century.

After the Flemish defeat at Arques popular feeling was inflamed against that section of the community who were known as Leliaerts, or adherents of the Lily, and in November the Yprois rose and killed 9 sheriffs, 4 councillors, and 8 principal inhabitants who were suspected of belonging to the French faction. Once more in the treaty of peace it was stipulated that the Ypres fortifications should be razed, but this decree was not carried out.

In the rebellion of 1324 Ypres and Ghent stood firm. But the former was besieged by the insurgents, and as many of the inhabitants sympathized with the rebels the resistance was weakened and the place surrendered on terms.

The construction of the Outer Defence Line.

In 1325, after the capitulation, the rebel leader, Nicholas Zannekin of Furnes, considerably modified the fortifications of Ypres. He had the old ramparts pulled down and caused parts of the moat to be filled in. He then constructed a new suburban defence line which practically coincided with the line that had been marked along the extremity of the suburbs of the city nearly half a century before. Along this extended line an earthen rampart was thrown up and a double ditch was excavated. This was a tremendous piece of work, for the defencible perimeter was immediately increased from 4500 yards to about 16,000 yards. Nine passages or gates were pierced in the new *enceinte*, eight of them bearing the same names as the old gateways of the XIIth century, whilst the new one, between the Messines and Hangoart gates, was called the Comines Gate.[1] The Steendam postern had

[1] The Comines Gate disappeared about 1395 when the outer line of defence was abandoned and the line drawn back again to the town itself.

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no outlet through the suburban defence line. It took no less than four years to throw up this prodigious rampart and to excavate the double ditch,[1] and the work was only just completed in 1328 when the King of France made one of his periodical assaults on Flanders.[2]

King Philip moved slowly to Cassel, where he encountered and overthrew the Flemish forces and then advanced towards Ypres. The inhabitants very wisely went to meet the king at Vlamertinghe, offered him the keys of the city, and made their submission. This saved the town, but Philip entered Ypres, made the inhabitants pile their arms on the Grande Place, and demanded that the great alarm bell in the belfry of the *Halles*[3] should be handed over, and the town was later ordered to pay a fine of twenty-four thousand pounds. The country being subdued, the King of France and his army withdrew from Flanders, leaving the weak Count Louis of Nevers[4] to govern and settle the country.

In accordance with previous precedent, Philip ordered that Zannekin's new suburban defence line around Ypres should be demolished, but to be quite in accord with precedent the Yprois succeeded in maintaining a policy of masterly inactivity, so far as this demolition was concerned. Then in January 1333 the king gave authority to the people to rebuild the close defences of the town—the old earthen rampart and ditch encircling the place itself and pierced by its old stone gateways, which Zannekin had done away with. Thus from this period, until after the famous siege in 1383, Ypres was surrounded by two defensive lines—the outer, or suburban, and the inner, or urban line.

For a time internecine warfare raged in Flanders, Ypres and Poperinghe came to blows, Vlamertinghe was burned during the

[1] The ditches were separated by a berm, or dyke, of earth on which a palisade was erected. This obstacle was looked on at this time as almost impassable, and it was essential in this case, since the defence of such a lengthy line must have taxed the garrison severely.

[2] Around the whole defencible perimeter and running at the foot of the interior slope of the rampart was a road, called the *Ommeloopstraat* (or Round Way). Traces of it can still be found, notably that stretch of road that skirts the western edge of Zillebeke Lake (only dug in 1295).

[3] The Belfry, built in 1201, was the oldest part of the buildings of the *Halles*. The main buildings, with a facade measuring more than 150 yards in length, were completed in 1304.

[4] Count Louis was killed at Crécy (1346) fighting on the French side.

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quarrel, and Poperinghe suffered severely before mutual goodwill was restored.[1]

But there are nobler deeds to record than civil quarrels. At the naval battle of Sluys, between the English and French, a small Flemish squadron assisted in the crushing victory gained by the English fleet, and on the Flemish ships were 700 men from Ypres under the command of Maurice Ramault. In this battle, fought off the mouth of the Schelde, the naval supremacy that had been gained for France by Philip the Fair was lost by Philip of Valois when his anchored ships were destroyed by a more ably led and quicker foe, and the command of the narrow seas passed into English hands. Ramault and his men, to perpetuate their share in the victory, on their return from Sluys formed the Company of St. Michael.[2]

English Troops Garrison Ypres.

Between July 1343 and January 1346 English troops were on garrison duty in Ypres, placed there by Jacob van Artevelde, who had made an alliance with Edward the IIIrd. Feeling that the presence of the English soldiers secured the safety of their town from possible reprisals, the Yprois, jealous of their weaving rights, carried out raids against Poperinghe, Langemarck, Zonnebeke, and Reninghelst. These armed forays were bitterly fought, but the Yprois who could afford to muster at full strength were successful on each occasion, and they managed to burn houses in which the weaving trade was carried out and to commit a number of excesses. Thus was established the first connection of an English garrison with the city of Ypres. These troops were removed from Ypres shortly after Artevelde's assassination at Ghent. In the Great War the safety of the place for four long years was watched over by English troops, and this released the Belgian Army, not to make raids on its own countrymen, but to withstand successfully the onslaught of a powerful foe.

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[1] The origin of these disputes was the desire of the Yprois to suppress weaving in the neighbouring places. Ypres also attempted to standardize cloth, which was resisted by the other towns.

[2] This society was only dissolved in 1794, at the time of the French occupation.

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The Battle of Houtkerque.

In the year 1347, whilst Edward the IIIrd was besieging Calais, Philip of Valois despatched a French force under the Duke of Normandy to make a diversion by invading Flanders. Cassel successfully resisted the invaders, and the French then marched on Ypres. The city at this time had probably reached the zenith of its greatness. It was covered by two fortified lines, had a numerous and wealthy population numbering about 80,000 souls,[1] its weaving trade was flourishing, and undoubtedly it was now one of the leading cities in Flanders.

On this occasion the Yprois decided to meet their enemies in the open, and under the command of John van Houtkerke the force marched out to the encounter. The French were met near Houtkerque (about 14 miles west of Ypres) and battle was joined. Fortunately other Flemish forces were able to co-operate, and the garrison of Cassel stoutly stemmed one success gained by the French. The Yprois contingent, fighting over ground that neutralised the French horse, overcame their immediate foes, pressed on towards Cassel, and attacked the enemy in rear. The result was a complete defeat for the French, and the Duke of Normandy withdrew his shattered host to France. Much credit must be given to van Houtkerke and the Yprois for taking the field so promptly and not remaining passively behind their entrenchments. As it was they succeeded in combining with their friends on the very battle-field itself and assisted in achieving a remarkable victory.

Between 1348 and 1361 civil strife and severe riots frequently disturbed the peace of Ypres, and a more serious outbreak occurred in 1380. Meanwhile in the war of 1356 between Louis of Mâle, Count of Flanders, and the Duke of Brabant a contingent of over 1100 Yprois acompanied the Count's forces which in October seized Brussels, the Duke's capital, and finally brought about a victorious issue in the following year.

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[1] The figure of 200,000 sometimes given for the population of Ypres at this epoch probably refers to the population of the whole over-lordship. 80,000 appears to be a more accurate figure for the town and its large and extensive suburbs.

(To be continued.)

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THE SERVICES OF THE ROYAL REGIMENT OF ARTILLERY IN THE PENINSULAR WAR, 1808 to 1814.

By Major (Bt. Lieut.-Colonel) J. H. Leslie *(retired list)*.

[Continued from page 249, Vol. LI.]

CHAPTER V (1811).

THE year 1811 was one of great activity in the field, Operations commenced with the retreat of the French army into Spain from the country in front of the Lines of Torres Vedras. This began during the night of 4-5 March. (Oman.[1] IV. pp. 86-7.)

Thereafter actions, combats, battles, and sieges followed in rapid succession.

The various "affairs" of the year, in which the Royal Artillery took part were :—

March 5	Battle of Barrosa[2]	Oman. IV. 107-25.
„ 11	Combat of Pombal	„ 138-9.
„ 12	Combat of Redinha	„ 141-3.
„ 14	Combat of Casal Novo	„ 151-3.
„ 15	Combat of Foz de Arouce	„ 155-8.
„ 25	Combat of Campo Maior	„ 258-8.
April 3	Combat of Sabugal	„ 191-7.
May 3-5	Battle of Fuentes de Onoro[3] ...	„ 310-48.
„ 8-15	1st Siege of Badajoz[5]	„ 379-87.
„ 16	Battle of Albuera[4]	„ 373-404.
„ 25	Affair of Usagre	„ 412-5.
„ 30 to June 10	2nd Siege of Badajoz[5]	„ 404-31.
Sept. 25	Combat of El Bodón	„ 562-73.
„ 27	Combat of Aldea da Ponte ...	„ 579-81.
Oct. 28	Capture of Arroyo dos Molinos ...	„ 602-5.
Dec.	Defence of Tarifa	Oman. V. 114-29.

[1] *History of the Peninsular War* by Professor Sir Charles Oman. 1902-1922.
[2] Journal of the Royal Artillery. XXXVII. 139-60.
[3] „ „ „ „ XXXVIII. 99-122.
[4] „ „ „ „ XXXVI. 49-69.
[5] Unsuccessful.

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"Barrosa" (near the sea-coast, about 15 miles S. from Cadiz), which was an "affair" quite apart from the operations of the main army, will be dealt with first.

It cannot be said definitely which Companies of R.A. then stationed at Cadiz were attached to the three Brigades of guns which formed the artillery part of the force engaged at Barrosa. Officers, N.C.O's, and men were taken from Companies, as required, but from a careful examination of the Muster Rolls of the six Companies shown in the accompanying List, and taking into consideration the several officers who received medals, with the "Barrosa" clasp, it may, I think, be fairly assumed that the guns were manned by detachments from *each* of the 6 Companies.

Cairnes and Raynes, of Dickson's Company, were attached to Roberts's Brigade of guns, and Woolcombe of the same Company was Adjutant to Major A. Duncan, C.R.A. at Cadiz.

Hunt, who was in command of Campbell's Company, and Grantham, would have been entitled to receive the silver general-service medal issued in 1847—if they had been present, as they were then living (see page 405, Vol. LI of the *Journal of the Royal Artillery*). *Some* Officers and men *must* have remained in Cadiz. For list of Officers see page 386.

Major A. Duncan's Despatch (Public Record Office, W.O. 55/1195, p. 111), written on the day after the battle, and addressed to Major-General J. MacLeod, D.A.G., R.A., has never been published. It is here given in full.

Isla de Leon (Cadiz). 6 March, 1811.

Sir,

I have now the satisfaction of making a report to you of our proceedings since the 21st February, which my unceasing occupation from that time has hitherto prevented me from stating in detail as they took place.

On the 21st we sailed from Cadiz, embarking our three Brigades, viz. Captain Hughes, with three six pounders and one Howitzer; Captain Roberts with the same, and Captain Gardiner[1] with three

[1] 2nd-Captain of Roberts's Company.

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nine pounders and a howitzer. From our scarcity of horses and the necessity of attaching six to each six pounder & its Carriages, and eight to each nine pounder, we were obliged thus to curtail the Brigades. On the 25th and 26th, the army arrived and landed at Algeciras and proceeded to Tarifa, the road to which being impracticable for Artillery, the guns and horses went round by sea, and the Detachments marched. As many mules as we could get together here in addition to our horses, were embarked for the conveyance of our reserve gun ammunition and that for the troops, trusting that as we advanced in the country we might purchase or procure others, but in this I was disappointed, so much so as to be obliged to leave at Tarifa a gun from each of the six pounder brigades[1] (the General being particularly desirous that the nine pounders should move complete) in order to forward a sufficient quantity of rifle and musquet ammunition.

At this place [Tarifa] I found Lieut. Michell[2] with two guns, a strong detachment and a proportion of mules for their service. He had been there for some months, detached with the 28th Regiment[3] from Gibraltar.

As they moved forward with the Army and as he had always been taught to expect that he should accompany them, I took him on with me, leaving his guns behind, appointing a part of his Detachment and all his mules to the escort and conveyance of small-arm Ammunition. I must here mention that this Officer's local knowledge (for he had on a former late occasion accompanied the 28th Regiment within a league of Medina Sidonia) and his zealous exertions were of great assistance to me in many instances.

General Graham's dispatch[4] will detail our march, which, when completed, brought us (together with our Allies who were about 7000) nearly abreast of Chiclana, with our left to the sea, where we

[1] *i.e.* two 6 prs.

[2] E. T. Michell, who belonged to Captain W. Morrison's Company, 8th Battalion, R.A., then stationed at Gibraltar.

[3] The 1st Battalion of the 28th (North Gloucestershire) Regiment of Foot. In *Campaigns of the twenty-eighth Regiment* by Lieut.-Colonel C. Cadell, published in 1835, we find on p. 86:—

"On the 13th April [1810], Major [John Frederick] Brown left Gibraltar, with four light companies and a party of artillery under Lieutenant Michell, and took possession of the old Moorish fortress of Tarifa. . . . . In September . . . . the remainder of the Regiment embarked for Tarifa."

This Regiment is now (1926) the 1st Battalion, The Gloucestershire Regiment.

[4] Dated 6 March, 1811.

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arrived yesterday morning[1] after much fatigue to our Horses, but they got through it extremely well.

Between eleven and twelve o'clock the Spaniards were engaged with a body of French Troops immediately on the sands opposite to the point of Santi Petri, and in the wood fronting our position; they then pushed forward nearly their whole force to assist those engaged, and General Graham was ordered to follow with our Troops for the purpose of taking up a position between S. Petri and the Enemy.

No sooner had the British entered the wood, which was of considerable extent, than the main body of the French Troops who must have been well concealed, marched rapidly to possess themselves of the ground we had left. General Graham on being apprized of this (not however until we had considerably advanced into the wood) instantly turned back to meet them. The whole of our Brigades amounting to ten pieces[2] were marching together in column near the front of the Troops; they immediately countermarched with the rest and got out of the wood with all speed. As soon as we cleared it the Enemy were seen to be within 1100 yards, and deploying into line on an advantageous position, whilst ours could scarcely have been worse being much confined, low, and in the midst of high Furze; such was the General's anxiety for the Artillery to get into action that we did so before our Troops were up, so that for more than 20 minutes while our Light Corps engaged the Enemys on their right Flank the ten guns (formed together in line) carried on a most destructive fire against their centre and left Flank. The ground admitted of no manœuvering so that the action very quickly became general and I believe a warmer one never took place. Our guns were much exposed to the Enemy's Light Troops and were, besides, enfiladed from the beginning by their Artillery on our Right Flank.

After an exceeding hot fire for about an hour the General brought up his Second Line, formed closer action and presently charged both forward and to our left Flank where the Enemy had pushed round a considerable force; this ended the day without the assistance (I may almost say) of a single Spaniard out of their 7000!

[1] 5 March, 1811.
[2] Three 9 prs., four 6 prs., and three Howitzers.

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The French drew off leaving six pieces of Ordnance, viz:— Two seven Inch Howitzers, Three Heavy 8 Pounders and one 4 Pounder, with some Ammunition waggons. Two Generals (one of them a General of Division), an eagle and an immense number of killed, wounded and prisoners.

The British have also I fear suffered dreadfully. I must however beg to refer you to the General's dispatches for these Details, and am impatient to report to you that the coolness activity and skill of the Artillery were never more conspicuous than in the conduct of the Officers and men of the Brigades I had the happiness of Commanding; the exertions of every individual in his respective station have been throughout the whole of this expedition beyond any acknowledgement I can make and the fulfilment (or completion if I may so call it) of their duties yesterday surpassed any thing I ever witnessed. I trust you will do me the favour to make a report to this effect to the Master-General of The Ordnance.

Enclosed I have the honour to transmit a return of the killed & wounded, which when the Establishment of our Brigades curtailed as they were is considered, will pretty clearly shew how far we are justified in saying that the action was a *warm one.* It is extraordinary that under such a fire our loss in *killed* should be so trifling, altho' that of wounded is most severe, the whole of the Enemy's Fire being for a considerable time from the commencement of the action directed against the Battery formed by our guns; indeed their whole force seemed to be directed towards us, and occasioned General Graham to make his formation in rear of the guns, so that much of the fire intended for us reached them and caused dreadful destruction.

I must not omit to commend the exertion of Lieut. Wilkinson[1] of the Drivers Corps, and the steadiness of the men under his charge, exposed & unoccupied as they were from the Guns remaining stationary during the greater and severest part of the action.

The British Troops returned in the Evening to this place crossing the Santi Petri River by a bridge that has been for some time constructed there, and at day-light this morning the guns and carriages were passed over.

[1] R.A. Drivers.

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I am happy to add that after the action we were instrumental, notwithstanding the fatigue of the men and horses, in carrying off the Field the wounded on our Guns and cars and waggon; no time was to be lost and no other conveyance at the moment was forthcoming, such was the suddenness of the action, and as for this purpose I received an order to destroy all the musquet ammunition, & employ the carts and waggons for the above purpose.

The Gun detachments,[1] Guns & ammunition of the six pounder Brigades that we were obliged to leave at Tarifa are on their passage from thence round to this place.

I am most truly concerned to state that Lieut. Woolcombe, the acting Adjutant to the Detachment, died this Evening of the wound he received yesterday. A more gallant zealous Officer never existed; to his personal exertions I am so indebted that for every reason both public & private I must most deeply regret his loss. Lieut. Maitland received also a severe wound but from the report of the Surgeons to night there is much hope that he may yet recover, and that a most valuable & promising young man as he is, may be saved to the service.

Lieut. Pester's wound was from a musquet ball through the calf of the leg, but is doing extremely well; the other Officers are in the fairest way of recovery and no unpleasant doubts whatever entertained to the contrary. I cannot conclude without assuring you that the effect of the *Spherical case*[2] was on this occasion conspicuous.

I have, &c.

(sd.) A. DUNCAN, Major, Comg. R.A.

P.S.—In consequence of the great loss of Horses in this affair, I must beg to observe that a fresh supply of them would prove most acceptable, and the old horses not having stood their work as well as could be wished, I am induced to hope the next may be younger if to be had.

(sd.) A.D.

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[1] See *ante*, para. 2.

[2] The invention of Lieut.-Colonel H. Shrapnel, R.A. They were originally called "spherical case shot", and are often mentioned as "Shrapnel's" shells, but the term "shrapnel" was not officially adopted to describe them until 1852.

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RETURN of KILLED, Wounded and Missing of the Royal Artillery, Royal Artillery Drivers, and Horses, in the action of 5th March, 1811.

		Captains	Subalterns.	Staff.	Serjts.	Rank & File.	Total	Horses.
R.A.	Killed	—	—	—	—	3	3	17
	Wounded	2	6	1	—	32	41	22
R.A. Drivers	Killed	—	—	—	—	2	2	—
	Wounded	—	—	—	1	7	8	—
	Missing	—	—	—	1	—	1	—
	Total	2	6	1	2	44	55	39

Names of Officers Wounded.

Captain	P. J. Hughes.	Slightly.	
2nd Captain	W. Cator.[1]	,,	
Ist Lieutenant	E. T. Michell.	,,	
,,	P. J. Woolcombe.	Dangerously.	Since dead.
,,	W. Brereton.	Slightly.	
,,	B. J. Maitland.	Severely.	
,,	C. Manners.	Slightly.	
2nd ,,	H. Pester.	Severely.	

(sd.) A. DUNCAN, Major, Comg. R.A.

Return of the number and nature of guns taken from the Enemy.

Two seven inch Howitzers.
Three Heavy Eight Pounders.
One four Pounder with Cars and Ammunition.

(sd.) A. DUNCAN, Major.[2]

* * * * * * * *

[1] He hunted the Isla de León hounds in 1808-9.

[2] He received a brevet Lieut.-Colonelcy, with effect from 6 March, 1811.

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A List of Officers in the six Companies, R.A., stationed at Cadiz, in March, 1811.

Compiled from the Official Monthly Returns, and Muster Rolls now in the Public Record Office, Chancery Lane, London.

Battalion.	Designation in 1926.	Captain.	2nd Captain	1st Lieutenants.		2nd Lieutenant.
2nd	4th Heavy Battery	P. Campbell[1]	A. Hunt	S. P. Brett	T. Grantham	H. Pester[2]
5th[4]	9th ,, ,,	H. Owen	W. Cator[2]	W. Brereton[2]	G. H. Mainwaring	H. R. Wright
9th	Reduced in 1819 and not reformed.	P. J. Hughes[3]	F. Bedingfield[2]	J. Maxwell	C. Manners[2]	A. R. Harrison
10th	16th Pack Battery	W. Roberts[5]	R. W. Gardiner[3]	W. B. Dundas	R. Home[7]	W. Cozens
,,	32nd Heavy ,,	A. Dickson[5]	R. M. Cairnes	P. J. Woolcombe	W. A. Raynes[2]	L. Talbot
,,	15th Pack ,,	W. Shenley	J. Mallett	B. J. Maitland[6]	R. Godby	T. O. Cator[2]

[1] Serving in the Spanish Army. [2] Silver Medal with clasp 'Barrosa'. [3] Gold Medal with clasp 'Barrosa'.

[4] Muster Roll of March records that one gunner died in Cadiz from wounds received at the battle of Barrosa.

[5] Serving in the Portuguese Army. Captain R. H. Birch, 10th Battalion, R.A., was at this time attached to and in command of the Company.

[6] Embarked for England 2 May. Died at Southampton on 31 October, 1811, from the effect of wounds received in the Battle of Barrosa. [7] In Portugal.

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The British force was commanded by Lieut.-General Thomas Graham. His Dispatch on the battle is printed in *Wellington's Dispatches*, Vol. VII, pp. 381-5. He refers to the R.A. in the following terms:—

> "I owe too much to Major Duncan, and the Officers and Corps of the Royal Artillery, not to mention them in terms of the highest approbation; never was artillery better served."

(To be continued.)

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O.P.F.

The Modern Fortress.

By Captain J. L. P. Macnair, R.A.

I. General.

OVER two hundred years ago Vauban, Marshal of France, designed the fortifications which, up to the present day have protected the frontiers of France. The works raised by Palmerston's engineers at a much later date to guard this land against a feared invasion adopted Vauban's ideas. And the same plan has been followed by nearly every civilised country since his time. It was not until the opening of the late war that Vauban's fortress system was discovered to be obsolete. Liége fell after a short struggle, Namur after practically no struggle at all; Maubeuge was ill supplied and cannot be said to have had a fair chance. Their place was taken by a continuous system of temporary field works.

The German fortresses and several of the French were never severely tried, but one outstanding exception is the case of Verdun. It may be that Belfort, Epinal, Metz or Strasbourg would have stood up as well as Verdun if fully equipped and energetically defended. Is there any possibility then that the condemnation of permanent fortifications was erroneous? In considering the "rule" on which modern fortresses—if there are to be such things—should be built, we must first be satisfied as to this question.

So long as armies continue to exist, countries with land frontiers will always be faced with the problem of their defence. And though we all know that the true defence is attack, it is evident that attack to be good must be concentrated, thereby leaving long lines of country which will require some form of shield. This shield to be of any value must economise in man-power. A few troops must be enabled to hold up a greater number of attacking foes. Some form of trench system, whether there be permanent fortifications or not, will eventually be adopted by

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these troops. The *raison d'être* of the best of the pre-war fortresses was to provide a strong point, a "point d'appui" for this trench system, and the fortress itself consisted of an elaboration of the system, strongly built, ready for use, at short notice, and in an advantageous situation. Theoretically, such a point d'appui, fulfilling all the above requirements, should be an immense advantage to almost any temporary trench system that can be imagined. Some of the fortresses seemed in the early days of the war to be gigantic failures and there was a tendency to abandon them as inadequate and condemned death traps. Later these ideas were somewhat modified; and since the war there has been no appreciable attempt to dispose of fortresses, as there has been for instance of dockyards.

II. The present position.

Assuming then that some kind of permanent fortifications are still required, let us first consider in what particulars present fortifications fail, if at all, to meet requirements. We shall then go on to suggest how possibly they may be better met in the future.

The requirements of a fortress are:—

(1) That it should be a strong point or "point d'appui" of a trench system.
(2) That it should be strongly built.
(3) That it should be ready for use at short notice.
(4) That it should be in a good strategical and tactical situation.

Taking these points seriatim:

1. When studying the history of the French and Belgian fortresses in the war it becomes apparent that those which failed to have any marked effect on the course of events were sited at points which were strategically of great value but which had nothing to do with any temporary or even permanent defensive "system." Their siting had more of an eye to frontiers in the political sense than to the plan of campaign of an army. Those of later date, however, in the south, were constructed as part of a definite defensive plan and connected to a trench system which was in itself almost permanent in places. In spite of this, however, the subsequent temporary trench system seemed to be under the uncom-

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fortable necessity of adapting itself to the fortresses instead of the fortresses forming the foundation and strength of the trench system.

2. The stronghold of Verdun, with its casemates and tunnels, proved of inestimable value in the war as a shelter for personnel, staff and stores; as a sort of organising ground for the surrounding troops. But in view of the experiences of the Belgian fortresses and of Maubeuge, no one thought of concentrating fighting troops and guns in the places intended for them in the forts themselves. It seems fairly evident that no stationary spot on land can be made strong enough both to fight from, and to withstand bombardment. We may be able to make a turret or overhead cover of concrete and steel so that it will withstand an 18 inch howitzer shell. In the end, the shell will overcome it. The most valuable tactical lesson of the war was that concealment was the best protection.

The pre-war fortresses then, from the point of view of material strength were adequate except in so far as fighting troops were concerned. It is to be noted that this limited adequacy was nothing new. Many hours of comparative shelter from the holocaust were obtained in the aged ramparts of Ypres.

3. The immediate readiness for use of a fortress is largely a matter of finance, and consequently it tends to be subordinated to political expediency. It follows that the smaller the building and maintenance cost of the fortress, the more likely it is to be ready for use when required. The French and Belgian fortresses at the outbreak of war were expensive things and their preparedness is less a matter of public knowledge than of private chagrin.

4. The question of the strategical and tactical situation has been put last in the present discussion though hitherto it has probably held first place. The argument is that however good the siting of a fortress, unless it conforms to the requirements of the temporary line it is likely to be of little value and may even be a snare, as Maubeuge was in danger of becoming to the British Army in 1914. On the other hand there will always be places—railway junctions, river crossings, various defiles—which it will be desirable to deny to an enemy for as long as possible at the outbreak of war. Faced, however, with a determined assault, it is doubtful if the forts put to guard such places will in themselves give more than a few hours' grace. It is even more doubtful whether the

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tremendous expense of the fortifications (in the old sense of the term) is worth these few hours. Probably the only solution of this part of the problem of war lies in rapid sectional mobilisation and a prepared scheme. Liége held out for a few days. True they were all important days, but what would the difference in time have been if the Belgian Army had had mobile guns in place of the forts and a well thought out plan of open defence?

It is to be noted that we are dealing here with what is happily called civilised warfare. The forts on the confines of an empire, where the aggressors are inadequately equipped will naturally follow more primitive lines. Their financial aspect is also more local and less pressing.

III. The future.

Having thus appreciated the present position let us consider what form our fortress will take in the future so as to answer these requirements in the fullest possible manner while avoiding the pitfalls of the past.

The three branches that have mainly to be considered are (i) the infantry, (ii) the artillery, (iii) the headquarter services, including command and supply staffs and medical work.

(i) Since the Middle Ages, the infantry have never made a success of fortress fighting, unless they were outside the fort. Their action in the future, so far as fighting is concerned will lie in the temporary line of field defences. We can therefore dismiss them from consideration at this stage, except for the actual siting of the line.

(ii) The artillery require (a) gun positions, (b) ammunition supply, (c) observation posts.

The fixed gun position in a modern war will almost certainly not be a health resort. Even if sited at the bottom instead of at the top of a hill, it will soon be located and its days numbered. The only place where it might be found is for coast defence where more or less direct fire is the order of the day and there will be no forward observing posts. But even here, railway mounting guns firing mostly from behind cover provide an attractive alternative. It is to be noted that a hilly sea front is not a necessity for this type of armament. Artificial flash cover could easily be provided.

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But in land forts there seems to be no question that the mobile or semi-mobile guns will be the pieces to use For these no preparations at all will be necessary. The guns can be kept in store or in barracks and training would coincide with that of the Field Army. The "scheme" would be there, however, the defensive system arranged (depending on the infantry requirements) and the gun positions chosen.

As regards ammunition supply, there does not seem to be any pressing need ordinarily to burden the fortress with a huge stock, so long as the necessary stock exists somewhere. If the necessity for such provision outweighed the expense, underground and fully concealed chambers well within the defensive lines would meet the case.

When we consider observation posts, however, the situation seems capable of considerable development. In the pre-war fort, observation took place from the neighbourhood of the gun. Given a mobile armament this will be out of the question as well as undesirable. Our experience in the war has given us many valuable lessons on the selection of observation posts, none perhaps more valuable than the fact that where no suitable post seems available, one can be made. Some of the best O.P's in France were constructed of concrete and steel in chimneys, barns, ruins of all descriptions, while the artists exercised their ingenuity in fashioning trees of life-like appearance. These are works which on a proposed line of defence, could very well be done in peace time. They could be made quietly with very little expense, in large numbers, and it is thought that with a little management their existence—at any rate the existence of many of them—could be kept quite reasonably secret. One or two would be a nine days' wonder to the boys of the local village, but they would remain unadvertised and would sink rapidly into oblivion until the unfortunate day came when they would be turned to good use. Government tenure of the land would in most cases be unnecessary. Few landlords would object to the erection of inconspicuous small posts in the edges of his woods and fields, even in a corner of a barn. In some cases it would be an advantage to provide covered approach, preferably by small tunnels running back to a covered piece of ground.

It is thought that such a system of O.P's, sited in or even in

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front of the proposed line of infantry trenches, comparatively cheap to erect and requiring but little yearly maintenance, would more than double the value of the artillery and would convert what must by the nature of modern warfare be mobile guns into a solid rock on which to build the foundation of the defence.

(iii) There remain the headquarter services, the citadel, so to speak, of the fortress. Hitherto these have been housed mainly in casemates in the forts themselves. But forts in the old sense of the term will no longer exist. These services are therefore free to seek for themselves a more advantageous position. In the late war, owing to the more pressing demand of the troops in the line, unless some ancient rampart was handy, they mostly found themselves in the open, or in hastily constructed dugouts. But if the fortress is to offer an impregnable resistance to a determined onslaught (which should be the aim and object of a fortress) these services to work efficiently require adequate cover. The need will be met by the construction at suitable points behind the line of strong and commodious ferro-concrete cellars. They could be made under specially selected buildings or under the open fields, deep enough for the corn to grow above them so that they could lie, forgotten to all but the Command Staff records. They would need tunnel connection to the roads so that when opened out for use their approaches could not become obvious to aircraft.

This branch of the fortress would of necessity be rather more expensive than the O.P's. Nor does it appear so urgent. Financial provision could overlook the cellars until the O.P's, the nerves and sinews of the defence, are fully provided.

IV. Subsidiary questions.

Two points have not been touched, viz., communications and anti-tank defence.

It is thought that communications might very well be left till the outbreak of war. In the fortress envisaged above, points will be somewhat scattered and by no means all of them will be used. Buried telephone lines are troublesome to maintain and experience seems to show that they are almost as liable to failure as those that are laid quickly when required. The provision of small tunnels connecting the exposed points to covered ground will probably satisfy immediate needs.

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Anti-tank defence is altogether in the realms of theory and discussion. We do not even really know what it is we shall have to provide a defence against. Probably if the tank enthusiasts were given an absolutely free hand they would plant belts of forest across the path of the invader. For the present it appears unsound to attempt any solid expenditure on so liquid a project but to accept with a guarded mind the comforting truism that the best defence against a tank is a tank.

V. Conclusion.

It will be said that we have dealt almost entirely with the land fortress to the exclusion of coast defence. The answer is that coast defence is hardly carried out by a fortress in the full sense of the term. A defended port will be attacked from the sea by ships which in the first instance will use guns only. An attack by a landing party, including possibly tanks and supported by coastal motor boats cannot be anticipated by placing defences at certain points. It would have to be met by the best advance intelligence and a mobile force. The object of coast defences, organised in peace time, will therefore be to oppose a bombardment, and apart from the air arm, this means purely guns, with the necessary gun control. Consideration will therefore be directed not so much to the best type of fortress but to the best type of gun, and it is not proposed to deal with the matter more fully here except to indicate the well known possible superiority of the railway mounting over the fixed emplacement. Financial considerations make it unlikely that any change in present methods will be made unless this superiority can be proved to be decisive.

Land defences are however another question. In England, the numerous old fashioned land forts have quite naturally been severely neglected. The possibility of such defences ever being required is too remote to call for any very drastic consideration of a new scheme. On the continent, however, it is unlikely that the new frontiers created by the war will be left for ever unfortified, and it will be of absorbing interest to see on what lines the new works, when they arise, will take shape. We must see to it that our interest is not entirely academic. Though England is an island, the Empire as a whole does not share this country's perhaps fictitious

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isolation. An example in the minds of most people nowadays is Singapore. This great base, in the opinion of many, can be defended relatively easily from the sea. If it is ever attacked the chances are at least equal that it will be attacked from the land side by an army landed at some fairly remote and uncontrolled portion of the coast.

Whether then for the land defence of a seaport, or for the protection of a frontier, the fortress of the future appears in its most logical form to take shape as a string of observation posts, splinter proof and permanently camouflaged, sited with reference to the scheme of infantry defensive lines, with tunnels, where necessary to connect them with covered ground. They should be made in large numbers so that the destruction of several will not impede the work of the guns.

These will provide a cheap and efficient back-bone on which to base the defence, and apart from them nothing is really necessary. In very important places where elaboration is called for, the headquarter services will be provided with invisible shell-proof shelter which, as it will not be occupied by fighting troops, can be sited to the best possible advantage for the organisation of command.

If yet further work was contemplated and money could be made available, the next step would be the provision of somewhat similar accommodation for sheltering the reserve troops in the field. This would however mean a great extension of the design, whose beauty so far lies in its simplicity. With all but certain important frontier posts of nations who are either frightened enough or wealthy enough to so elaborate their shield, such provision will probably best be left until war is at any rate threatened.

For the others, those who love and thrive on peace yet fear not war, the "O.P. Fortress" seems to offer a cheap and inconspicuous solution of their defensive cares.

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THE PROBLEM OF THE TANK.

By "Pom-pom."

COLONEL Rowan-Robinson's article in the April number of the Journal of the Royal Artillery must have given many Gunners furiously to think. The future he predicts for the Royal Regiment is not a pleasant one, and these notes are the result of an effort to see if some brighter prospect could not be found.

The gloomy outlook portrayed is based on the assumption that the only effective antidote to the tank is another tank. As a rule, an effective answer to any new weapon produced by an enemy is the production of a similar weapon oneself, yet that does not afford a defensive antidote. For example, in the navy the antidote to long range gunfire was increased armour above the water line; the antidote to this increased armouring was the torpedo, fired from destroyer, submarine, or coastal motor boat; the antidote to the coastal motor boat was the 2 pr. pom-pom. In the army the antidote to the defensive power of the machine gun was an artillery bombardment to crush it, not another machine gun.

That no antidote to the tank (other than another tank) is at present issued is probably due to two reasons:—

1. The need for economy.
2. The desire not to equip units with a new weapon until it is felt that the most perfect and final design has been evolved.

As regards (1), since the fighting arms are at present unable to stop an attack by large numbers of tanks, it is useless to pay for their upkeep in peace if there is any idea of their fighting a European war again. If no additional money can be found for expenditure on an anti-tank weapon, then establishments must be reduced in order to save the money required for this. We should then have an army which, however small, would be able to make an effective resistance to all weapons at present existing.

As regards (2), scientific discovery, which may often render a new weapon obsolescent almost as soon as it is issued to the army,

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necessitates great caution and long and exacting tests before any invention goes as far as the production stage. At the same time, an army cannot be trained for modern war with unsuitable weapons (or none at all). The explanation "Of course, as soon as war breaks out the very latest design will be put into production, and you will be issued with it when ready," will not last indefinitely. When is the army to have practice with some such weapons? The time must come when the risk of early obsolescence must be taken and the fighting arms of the service given their own means of defence against tanks, at least in small numbers.

At present the most efficient tank destroyer is the 3 pr. Hotchkiss gun. A direct hit at a large angle of arrival will penetrate present-day tank armour at 2000 yards. It seems probable that the limiting factor of weight on mobility will keep down the armour of tanks to somewhere near its present dimensions. It is suggested therefore :—

1. That the 3 pr. Hotchkiss gun (or some rather heavier weapon if tank armouring increases) is likely eventually to be adopted as the official anti-tank weapon.
2. That it should not be placed inside a tank because it should be;
   (a) Light—and a tank limits length of recoil and thus necessitates stronger and heavier parts.
   (b) Capable of very wide and quick traverse.
   (c) Easily concealed.
   (d) Easy to load and fire at great speed, and enable the crew to work with the greatest possible freedom.

   If infantry and cavalry are to have mechanical cross country vehicles in their first line transport, it might be carried in one of these, and be dragged into and out of action by the detachment, with some form of wheelbarrow for ammunition; otherwise a special type of limbered vehicle would have to be designed. The weight of the 3 pr. Hotchkiss for use in a tank is approximately 5 cwt. complete. It should be possible, with a longer recoil, to reduce this weight considerably.
3. That there should be two such guns per cavalry regiment or infantry battalion. This may seem a very small allot-

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ment, but working separately two should be able as a rule, to cover a battalion front. It must be remembered that a gun can be ranged best when its own shell are the only ones which can be seen. Nor do we want to produce in peace too many weapons which may rapidly become obsolete. Moreover the number of different weapons now issued to these arms must not be increased by more than is absolutely necessary.

4. That each battery of artillery have two such guns; if horse-drawn, then of cavalry pattern; if dragon-drawn, then mounted on spare dragons which could also be used for gun hauling when required.
5. That as a mobile reserve there should be companies of one or two-man destroyer tanks armed with the tank pattern 3 pr. on a scale of one company (16 tanks) per division. Whether these should be part of tank battalions, or a separate unit under Corps or Division, could be decided after experiment on manœuvres.

We then have:—

(a) A strong system of anti-tank defence sited in depth on tank approaches over the whole front, protecting the arms themselves and the vital services in rear, so vulnerable to tank attack.

(b) A mobile reserve ready to move up and counter attack any tanks which may have broken through the belt of infantry and artillery anti-tank guns; or to move out and oppose any tanks or armoured cars attacking round our flanks.

This then is the picture:—

The enemy launches a tank attack on a divisional front. Our foremost infantry, carefully trained in methods of avoiding casualties from tank attacks, make for any copses, thickets, ditches, and similar tank-proof localities, and remain there till the tanks have passed, ready to emerge and fight any infantry who may follow the tanks. The tanks do not linger here. They are already suffering losses from the battalion anti-tank guns concealed on the edge of tank-proof localities, and they cannot afford to cruise up and down

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squashing individual infantry. The infantry 3 prs. are taking advantage of natural cover from view; gun crews are fresh, have an unrestricted field of vision, and are not being bumped about by moving at speed. Their advantage over the gunners in the tank is enormous. But the task of the tanks is to get through to disorganise vital services in rear. They push on, with diminished numbers, and lose more on meeting the anti-tank guns of the battalions in reserve. Now they are in totally unreconnoitred country. Their crews are losing sense of direction and distance, and their moral is shaken when it is noticed that the number of tanks accompanying them has fallen considerably. The 3 pr. equipped dragons have received warning of the attack, are waiting in position ready for the tanks, and do more execution. A few survivors get through. Divisional Headquarters is in danger. They have been warned of the attack by wireless, however, and at once the divisional destroyer company was sent forward. With machines concealed behind a ridge, company, section and tank commanders see the approaching tanks from the top while still some 2000 yards distant. A plan of action is decided upon, one section is left for the immediate protection of H.Q., and the rest swoop down to the attack. Surprise is complete, and all is soon over. The tank attack has failed.

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CANNON OR CANNON FODDER.

By "O.B.E."

THE usual sequel to a war of any magnitude is that the nations who took part revise their training manuals, and base their principles on the lessons learnt in that war. Then as a period of peace supervenes, gradually the greatest lesson of all, i.e. the preponderance of fire-power, is apt to be forgotten.

Fictitious lessons are drawn from peace manœuvres, etc., and the memory of the casualties incurred at the commencement of each war fades, and as a new generation grows up in the armies, and those with war experience grow less and less, so gradually the effect of modern weapons becomes subordinated to movement. It is obvious that in the revision of handbooks each nation must take stock of the existant material likely to remain of use, the nature of the next war it has to prepare for, and perhaps the most important of all the number of men it will be able to put into the field compared with the man-power of its potential enemy.

It may be of interest to see how France, our ally in the Great War, dealt with these problems from 1871 up to and after the 1914-1918 war. Ever since 1871 the French knew exactly what their next war would be; they knew the scale on which it would be waged; they kept themselves in touch with what was going on the other side of the Rhine; and yet in spite of this were woefully deficient in the weapons which in 1914 produced the greatest fire effect—heavy artillery and machine guns. In an article in the *Revue d'Artillerie*, March-April, 1926, entitled "*Conjugaison des feux d'artillerie et d'infanterie*," Commandant Besnard says that as lately as 1911 General Pétain wrote of the 1875 training manuals "the authors had taken part in the 1870-1871 war, and even after the lapse of four years were still so much impressed by the destructive effect of gun and rifle fire as to base the principles of modern combat on the predominance gained by fire-power. After the Transvaal and Manchurian wars, these principles are proved anew." Besnard goes on to point out how the French gradually forgot that *moral* unaided was quite unable to compete with

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material. It also suited the politicians to forget, for although Germany their potential enemy was known to be increasing her heavy artillery, and to be pushing on the manufacture of machine-guns, the French did not follow their lead. When at last the politicians began to think about spending money on an artillery programme, some genius invented the "disc" which made it possible to use the 75$^{m}/_{m}$ gun as a howitzer, so nothing more was done.

Commandant Besnard says: "it seems unbelievable that while fire weapons were becoming more perfect—more accurate, quicker, longer ranging and more murderous—the pre-war drill book should have laid down that resolute infantry well commanded could advance under the hottest fire even against strongly held trenches, and take them." Now having criticised the French ideas of 1914, and having stated that the greatest fire power was developed at that time by heavy artillery and machine guns, let us examine their problems of the present day. First and foremost, given that infantry can no longer advance against troops who can make use of their fire weapons, are we still to believe the axioms:

(1) Artillery conquers, infantry occupy positions.

(2) The gun is the real infantry weapon.

Although movement against positions means movement accompanied by fire, are we to visualise this moving fire to be produced from behind advancing infantry by guns, or may we reasonably foresee its production partly from mechanical vehicles which will precede infantry. Such will be proof against the small arm weapons of the foremost enemy troops, but will in their turn have to be protected from concentrations of hostile artillery. This doubtless will be the task of artillery, unless aircraft have by dropping gas bombs already neutralised the enemy guns.

How do the present French handbooks cope with these problems? Once more France, in her own opinion at any rate, has the same potential enemy. As far as she can see her next war may be moving warfare, with periods of stabilisation, and all her post war drill books are written on these lines, and take into account all the lessons gained in the great war. Her handbooks take stock of the material at her disposal, and she fully realises that shortness of personnel makes it impossible for her to sacrifice needless lives during the opening stages of her next war. The peace treaty

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prevents her potential enemy from pursuing the course she did from 1871-1914 so that now the 1914 position is reversed and Germany must perforce aim at imbuing her citizens with the *moral* to fight an enemy depending largely on reduced effectives backed up by a preponderance of *material*.

So it would appear that France, taking her low birth rate into consideration and her potential enemy's crippled state, will aim at reducing her infantry or rather releasing them from the rôle of "cannon-fodder" by increasing and perfecting her material means.

Now for a glance at Germany. Certain weapons are forbidden to Germany by the peace treaty, and her army is reduced from a national army to a small professional long service force. On what lines is she to base her training to meet the menace of France's material strength.

One may be forgiven for supposing that she will look for some new weapon which may revolutionise warfare as we knew it in the late war. We may suppose that she will make use of propaganda to elevate the moral of her own population, by trying to prove to them that tactical handling allied to moral courage will make them capable of defeating material strength.

We all know how in 1918 the tactics of defence were modified to avoid the casualties caused by concentrations of artillery, how the front line became a mere outpost line, and how one became prepared to give up a strip of ground so that live men should exist to carry out counter-attacks. Again we know how our tanks upset these tactics. The tank is one of the weapons forbidden to Germany by the peace treaty, so that it is not surprising to find that Germany does not believe in tanks. Certain German writers claim that dependence on tanks cramps the initiative of infantry and destroys their moral.

Anyone who can read French might read Colonel Alléhaut's "La guerre n'est pas une industrie," which is a translation of the German General von Tayzen's "Material oder Moral" (published in 1922), and which is a criticism of modern French handbooks.

Our own problems must perforce be very different from those of France and Germany, but we should never forget the devastating results of concentrations of fire, and I write this article in the hope it may help to "rub this in" and that it may induce a readier pen than mine to enlarge on this most important subject.

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IRAQ AND MOSUL.

By Lieut.-General Sir George MacMunn, K.C.B., K.C.S.I., D.S.O.

1. The Frontier Agreement.
2. The Strategical and Political Aspect.
3. The Future of Iraq itself.
4. The Administration.
5. Defence.
6. The Assryians.
7. Trade Industry and Trade Routes.

The Frontier Agreement.

THE Agreement of Turkey to the ruling of the League of Nations with regard to the frontier of Iraq and to the general boundary line, is a satisfactory conclusion to one of the most difficult of the problems which the war has left on our hands. It is perhaps still more valuable in that it definitely marks an improvement in that curious stirring of Eastern bile against Great Britain during the years subsequent to the Armistice. Great Britain had gained immense prestige as the staying force among the Allies, had most effectually protected her own eastern subjects and allies from the pressure of war, had treated her Turkish prisoners with great humanity and was prepared to help in Turkish reconstruction. Yet, in all eastern countries, an untimely anti-British wave had arisen.

It has been slowly receding, and the fact that Turkey has openly announced the common-sense opinion that Great Britain is too important as a friend to be quarrelled over concerning Mosul, denotes a not unimportant change in the atmosphere.

The agreement between the British and Turkish Governments, signed at Angora on June 5th, lays down the frontier which follows the Brussels Line with the exception of a small amendment to bring the road between Alaman and Ashuta within the Turkish territory. It is a trivial amendment and does not really alter the Brussels Line which is a slight modification of the boundary of the old Mosul Villayet or province.

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The line itself runs east and west in its general direction, though with many undulations, and as the crow flies is just over 130 miles long from Pesh Khabur on the Tigris to the Gadir Pass on the frontier of Persian Kurdistan, following for the first fifteen miles from Pesh Khabur, the right bank of Khabur river and for fifteen miles more that of its tributary the Helik. Thence the course is along convenient water partings and hilltops and nowhere is there a line of strategical value. North of the line are the great mountains of Turkish Kurdistan and the highlands of the Assyrians, about Hakiari Julamerk and Neri. South of the line are more, though lesser, mountains which gradually run down to the plains of Nineveh and the open valley east of the Tigris.

Through the centre of the frontier line, from out of Turkish Kurdistan, run the waters of the Greater Zab which join the Tigris south of Mosul. From the western extremity of the boundary between Iraq and Turkey the frontier between Iraq and Syria runs south-west to the Euphrates in a line which is little more than a compass bearing. The Turk cannot approach Mosul on the western side of the River Tigris except by crossing a tongue of Syria which intervenes between Turkey and Iraq, the boundary between Turkey and Syria running practically east and west from Nisibin to Jezira-ibn-Umar on the Tigris, which is 17 miles north of Pesh Khabur. In the hills south of the new boundary there is neither town nor river of importance, and though beautiful and fertile valleys occur, the country is largely holly-clad hills and precipitous gorges, inhabited by a portion of those Kurdish tribes whose economic life has always been connected with the Tigris Valley.

Sir Ronald Lindsay in obtaining the acquiescence of Turkey to the frontier line has no doubt succeeded in allaying the genuine fear in Turkish minds that we intended to use the Kurds of Iraq as a focus for stirring up anti-Turkish sentiment among the Kurds of Turkish Kurdistan—which fear had a considerable share in creating the Turkish claims to Mosul.

The Strategical and Political Aspect.

While the question of the future of Iraq, as well as the inclusion of Mosul therein, was going through its last stages before

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the League of Nations and the House of Commons, there was a very strong attempt made in a portion of the British press to persuade the public to wash their hands of the whole business. It was urged that it was a financial drain that we had no right to put on our taxpayers and a political and military danger that we had no right to assume. The attitude was the same as that taken up by certain obdurate and influential members of the American Senate as regards the liabilities of the United States towards Europe, with the essential difference that their views have regard to a future policy, while Great Britain is concerned with one of unavoidable consequences of our action during the Great War. The view of H.M. Government, and of the great mass of the public is that for reasons good or bad, but which seemed right to the Government of the day, we went to Iraq and eventually became involved in very large operations there, taking on, by deliberate and solemn promise, very special obligations to the whole of the Arab subjects of Turkey.

The pros and cons of our Arab policy can be a matter of endless discussion, the wisdom or unwisdom of the promises we gave and of our attempt to raise Sherif Hussain of Mecca and his family to the Arab hegemony may easily be condemned. When the reasons came to be fully known, the verdict of history will probably be that we made the best of a difficult and unsatisfactory situation. But that is neither here nor there in the immediate matter of the future of Iraq. We had promised to make the Arab free of the Turk and support an Arab kingdom. In Iraq, which was occupied from the beginning of the war, we used every influence in our power to enlist the support of local opinion and local action and our Government supported by the public approval have insisted that our pledges must be redeemed.

The corollary of the situation was that without the debatable Mosul province, wrested from the Turks by force of arms in common with the provinces of Basra and Baghdad and an integral part of the economic system of Mesopotamia, the new state could not look for financial equilibrium, and further that, without prolonged British support and tutelage, it could neither survive, nor attain that equilibrium, even with the possession of Mosul.

The State of Iraq has enthusiastically and thankfully accepted

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the signing of the Agreement and the Secretary of State has been the recipient of grateful and complimentary acknowledgments from the Iraqian Government, as indeed he and H.M. Government well deserve. That Iraqian memories are likely to be long is another matter, for the Arab mind is proverbially a fickle one. Relieved of the fear of a Turkish attack, the politically minded of Iraq will ere long attribute any untoward condition to the baleful influence of Great Britain, for that is for the moment the disease from which the East suffers. Happily there are some signs of its abatement and the Agreement with Turkey is concurrent with a lower temperature in other countries, for the East still loves a man, and we have been able to play the man lately rather more than during the first aftermath of the war.

Strategically the new frontier has no significance—strategic and defensible frontiers are never easy to find and as has been explained this inter-mountain frontier has no impassable barriers, though military forces of any size can only reach the Tigris plains by crossing the tongue of Syria already referred to. Turkish troops could only do so by direct agreement with or in direct defiance of France. And though the fact remains that we have added to our responsibilities a frontier marching with a considerable and uncertain power, the point of strategical pressure by Great Britain would always be in the Levant unless such a world upheaval occurred as produced a repetition of the vast river operations which we were led into in the Great War.

The long frontier of Iraq which marches with Persia is, of course, an added source of possible friction in which we may be concerned; on the other hand our relations with Persia, as regards trade and business have always been good; Persia, in the hands of what promises to be the first competent government for a hundred years, can only need more trade and more business, and remarkable to state, appears to be becoming a barrier, rather than an easy prey, to Bolshevism. There will be room for customs and minor frontier wrangles between Iraq and Persia, but British influence should always suffice to ensure their settlement on amicable lines. On the whole we shall probably gain in the future by closer intimacy with Persia, but, on the other hand, there is no getting away from the fact that the circumstances that drove us to Iraq has undoubtedly

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widened our daily liabilities. There are, however, many compensating factors in the present situation, which, though by no means a justification for the deliberate adoption of responsibility for Iraq in ordinary circumstances, have considerable value in the balance sheet that has been forced on us. In the first place there is the age-old question of slave running in the Gulf. Our present position in Iraq and the Persian Gulf has prevented any possible recrudescence of this activity. We tolerate existing servitude, but we can now prevent fresh negroid slaves from being imported. The arms traffic, the smuggling of arms into Central Asia and Afghanistan via the Gulf which gave so much trouble in the years preceding the war, is now dead. The mere disappearance of these two troubles alone is a very tangible gain. But the main anxiety for ten or fifteen years before the war, was the Baghdad railway and where its terminus should be, and who should exercise control over Kowat and its potential harbour. The whole of these intriguing questions and all the trade aftermath that they might involve are now settled and can only arise again in a form in which they can be dealt with fairly in the general interests of the world. With these old bogies dead and buried, the silver lining to the cloud is by no means trivial.

The Future of Iraq itself.

The foregoing pages deal with the problem of Iraq so far as Great Britain is concerned—as regards the country itself, what are its prospects? The answer is not very easy to find, because the future of any Arab race as a self-governing community belongs to the realm of experiment. The glory of the Arab as an empire builder departed many centuries ago and has yet to grow again. The ruler is a member of the Hashimite family, the son of Sherif Hussain for some while King Hussain of Mecca who failed, failed rather piteously in the race to which fate had called him. Will he make good where father and brother failed? The answer lies wrapt in the future. King Feisal is an Arab of the Quoreish, and his name stands prominently in the roll of Mecca as a descendant of the Prophet. He is tall and handsome and gracious. He has therefore many of the ingredients of success. Best of all under the circumstances he is safe in knowing that the British are his very

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disinterested advisers and will see his throne safe if he will let them. His subjects are polyglot, Arabs of the Sunni or orthodox persuasion like himself, Arabs in large numbers who belong to the other great division of Islam, the Shiah sect, Kurds who are orthodox, a considerable population who are Christian and many thousands of Jews. Of Turks, despite the Turkish outcry before the League of Nations, there are practically none, the few Turcomans who speak Turki are Seljuks of a wave of invasion far earlier than the followers of the House of Othman. There is perhaps safety in a polyglot folk; but it is the Shiah Arabs who will be most out of sympathy with King Feisal, should his rule fail. The Shiah priesthood is always ready for intrigue and because of the fact that the great sacred places of the Shiah lie in Iraq, it is a particularly powerful body.

The immediate problem on which all political rule must really lie is that of finance, and it is one of very considerable import to Great Britain. Can Iraq attain and maintain financial equilibrium? The progress made under this head is very interesting.

In 1924, a mission from the British Government, consisting of Mr. Hilton Young, M.P., and Mr. Vernon, visited Iraq to prepare a special report, of which the general purport was that the deficit between revenue and expenditure had decreased regularly year by year for several years and that equilibrium was now practically assured, but that there were two causes that would tend to disturb it. One was the impending incidence of the agreed share of the Ottoman Debt, and the other the cost of extra Iraqian troops to replace Indian troops which the British Government were about to withdraw. Since that report was issued the revenue has further increased and normal equilibrium obtained, but the service of the Ottoman Debt,[1] estimated at 85 Lakhs, still produces a difficulty.

The British Government has now helped to place the railways and the Port of Basra on a substantial footing, by waiving any capital value to which Great Britain might be entitled and for which some form of interest would be due. The railways had of course a lot of part-worn and old stock, but the Port is a first-class piece of work and a very considerable asset. The waiving of this value

[1] For those who do not understand it, it may be stated that much of Europe is represented in the bondholders of the Ottoman Debt and that each dismembered portion of the Ottoman Empire was required by agreement to take on itself a due share of the debt, even if it had had in the past little or no specific advantage therefrom.

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and due interest, is the simplest and least expensive way of assisting the young Government to get on its feet and meet its liabilities for the Ottoman Debt.

It would seem that the demands on Great Britain except for the expense of Air Force and military support are largely over. These, however, can never be met by Iraq and must be looked on as one of our war liabilities. It is the price paid for the quite remarkable preponderancy in the affairs of the Middle East, which fate has thrust on us which must have even now many indirect business advantages and in the future should bring many more.

THE ADMINISTRATION.

The administration of the country has steadily been converted from the provisional semi-military control under British officers which naturally endured during the war and while the future of the country was under discussion to an Arab one. That administration was a story by itself, a quite remarkable one in its way, and it was useful apart from its actual work, in giving many Arabs and Kurds a direct knowledge of British officers and British ways, a knowledge which has left behind a considerable liking. The sour anti-British bile is engendered in the political hotbeds of the town-talkers and never in the country-side.

The transfer of the administration from British to Arab hands has been carried out with considerable success, and Government were fortunate in having to their hands officers displaced from Egpyt with a knowledge of exactly the same shadow system of advice as was required in Iraq. The Arab ministers and officials now carry on with a small cadre of British advisers to assist them. The many plans for development formed in the years immediately following the war have been held up by the financial conditions of the country. The Arab eagerly demands modern improvements, but has not yet the resources to pay for them. Colleges, schools, hospitals, roads, bridges all progress steadily on sound lines, but perforce far slower than the enthusiast could wish.

The opening of the motor route across the desert makes Northern Iraq look more than ever to the west for its ideas and has minimised that isolation which was its earlier condition.

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Defence.

The indigenous military forces are interesting. First come the Levies, the remnant of the British occupation and a quite useful force commanded by British officers which remained remarkably staunch during the rising of 1920. The Levies are a substitute for additional British ground troops and belong to the transition period. Behind the wall of British troops, air and ground, and the Levies, the Iraq army, with its British advisers, is steadily attaining reliability. A flourishing cadet college is training young Arabs and Kurds to be officers, and the Iraqian troops proper have already taken the field against the Kurdish disturbers of Sulimanieh and Rowanduz. They are modelled so far as may be in the various arms, on the usual British lines and number between 7000 and 8000, and there were sufficient Arab ex-officers of the Turkish army available to form the first officer cadre. There seems no reason why in due course they should not be competent to take on the ordinary troubles of the kingdom, the Kurds of the hills and the Sheiks of the plains and marshes who demur to revenue charges

The Assyrians.

It is not possible to write of the recent settlement without some reference to the small but interesting people, the Assyrians, about whom we hear a great deal from time to time. They are undoubtedly a war legacy. Stirred by Russia and the Russian invasion of Turkey, they rose against the Turkish Government and with the collapse of Russia were driven out. So far as Turkey is concerned they have made their bed and must lie on it. Expelled from their mountains in the midst of Kurdistan, they came in great destitution into the British lines with all their people and belongings guarded by their militia and have been supported at British charges ever since. An admirable race of mountaineers, they have everyone's sympathy, but it is not easy to give effect to it. Bred for many generations on the snow-line, they cannot settle and live difficulty in the plains of Mosul and Baghdad. It was never possible to bring their lands, the mountains of Tiari and Hakiari, where their villages were mixed up with Turkish-Kurds, into the confines of Iraq, even though they lie but a few miles north of the new frontier. The best that can be done for the people is to settle them in Iraqian Government

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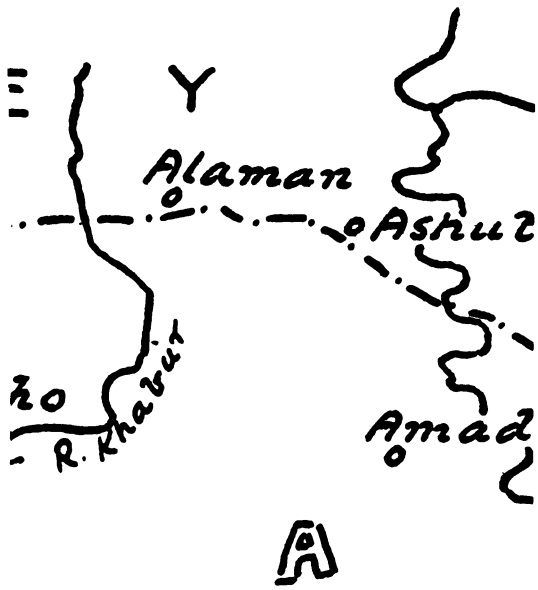

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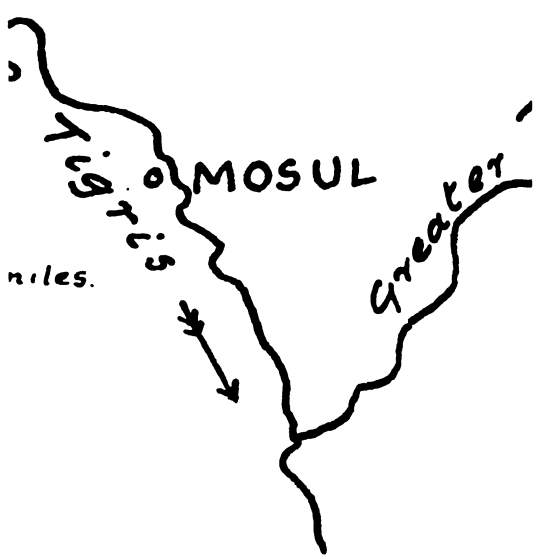

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lands in the lower hills near the Khabur and the greater Zab, within the territories of the Mosul province. It is not an ideal settlement, but it is a possible one, and from the Iraqian point of view has the merit of planting a very sturdy desirable frontier people along the boundary with Turkey. Their Patriarch, now a young man, is being educated at Canterbury, and his aunt, the Khanun Surma, is also in England. The Patriarch of the war was murdered by Kurds on his way to join the British; his nephew, who was inducted in Baghdad, died in a few years and this young man has been installed in his stead. The solution of this problem has always been the special care of the High Commissioner.

Trade Industry and Trade Routes.

The main export trade from Iraq is dates, of which the bulk goes by sea all over the world from Basra itself. In days gone by the "Date race" for the first new cargoes of dates into North American ports was almost as exciting as the earlier "Tea race." The first few cargoes fetched very high prices. The remarkable food value of the date is now recognised and the export to Europe and America total many thousands of tons. In Basra alone there are said to be eleven million trees, which pay a revenue in the neighbourhood of a shilling each per annum. That trade will always increase and the gardens of the Shal-El-Arab fringed with a half-mile fringe of gardens for over a hundred miles, has the remarkable facility of the tidal river and tidal irrigation. During the war many thousands of tons went home to the Food Controller in the ships which had brought out military stores. The gardens are planted on neatly dug gridirons of small canals; twice in the twenty-four hours the tide rises 9 to 12 feet and fills the canals to overflowing with fresh water backed up by the tide. That tide can irrigate and carry merchandise up the Tigris and Euphrates for over a hundred and twenty miles. It was to this that the Psalmist from the tideless shores of Palestine referred when he exclaimed "Turn our captivity, Oh Lord, as the rivers in the South."

There is a small export trade in wheat and rice, a trade which could probably be multiplied a hundred-fold, nay a thousand-fold, should a time ever arise when the world ran short of cereals. Then the League of Nations could overrule the Arab's dislike of

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strangers, revive the Babylonian canal system and pour in Indian colonists to grow corn. The only doubt in the success of such a scheme is the degree of *salinity* in the neglected soil which may make the problem of washing very serious.

The real interest of the world in Iraq lies in the oilfields. The oilfields of South Persia deliver their oil into tankers in the Shatt-el-Arab. It was the necessity to cover these fields that took us to Basra in the first instance. But oil is to be found in large quantities up the Tigris, though in what quantities cannot yet be told. Much of it is not very accessible until the world demand and the world price cover the cost of long pipe lines. The new treaty between Turkey and Iraq enacts that for a period of 25 years Iraq shall pay Turkey a royalty of ten per cent. on all oil dues; it also provides that Iraq shall, if she so desire, buy these out within twelve months from the signing of the treaty for the sum of half a million, and it is understood that this is to be done.

The story of the trade routes with Persia is an interesting one. Persia is curiously placed with reference to the Gulf. The routes from any Gulf port to her important centres are very long and extremely difficult, over mountain ranges of considerable peculiarity and, speaking generally, are only open to pack animals, though it is true that during the war the British did so improve the route to Teheran from Bushire that a Ford car could get through. The routes from the Gulf are from Bander Abbas, from Bushire, and from Muhammerah in the Shatt-el-Arab, the latter up the Karun River—a trade route kept open by the enterprise of a British firm and known as the Lynch road.

Directly after the war the plethora of cargo steamers on the Tigris, the opening of the railway line through Baghdad to Khaniquin and the Persian border, whence the British had made a motor road to Hamadan to join there the Russian road, drew trade to North Persia by that route. The Bolshevising of Georgia and the Caspian still further threw all Persian trade on to this route. Once trade has taken to a route, and found security, it is apt to stay there, and there is no doubt that Mesopotamia will see the bulk of the North Persia trade for many a year to come, which will all mean enhanced influence and prosperity.

Then it is to be remembered that Baghdad is but the lineal

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descendant of Ctesiphon and Babylon. They all lie within a fifty-mile ring, and they are all places at the end of the river traffic where trade leaves the *baylum*, the *shaktur* and the *mahela*, as the various types of boats are called, and takes to the caravan. Baghdad is now the centre where rail-borne and steamer-borne trade takes to the caravan, except consignments for the Persian border. The northern deserts and South Kurdistan and all the towns further up, trade by caravan with Bagdad, and every year that trade increases. It used to be the trade of Austria and Germany—a portion of it is now the trade of Britain.

There is one industry that the world is calling aloud for. It is the supply of long staple cotton. Since the war experiments have produced a long staple cotton in Iraq and already concessionaires are growing cotton—and if this development is a commercial success, the whole future of the country is assured.

On the Diala River, east and north-east of Baghdad, cotton irrigation is now an important business, while engineers are exploring Sir William Willcocks's scheme of letting the flood waters of the Upper Euphrates into the Habbana depression, thus obviating the devastating floods which now occur and letting them out in time of low river. It will resemble the ancient story of Lake Moeris on the Nile whose bed now is the fertile area of the Fayum and is a scheme of great potentiality and will require a considerable capital.

With the Turkish trouble settled and a future ensured for some years there are prospects of capital being available for any reasonable schemes, and the comparatively uneventful years since the war may give way to a steady agricultural and industrial progress. It is to be hoped that Great Britain, who has borne the burden of Iraq so long, will have every concession and advantage which may fairly be given to outside agencies, for the labourer is worthy of his hire.

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AFGHANISTAN.

By Major G. M. Routh, C.B.E., D.S.O., R.A.

THE country of the Amir is so seldom visited by Englishmen that a few notes on the position by an officer recently (November 1925) in Kabul might be of interest. Britain, like other powers, is represented by a Legation, but unlike the others, the English colony is confined to the Minister and his staff, so that few details of the country find their way home.

Yet Afghanistan is passing through an important phase, a phase which has considerable bearing on the world politics of the day. Before studying the internal position, however, a review in perspective of external influences might be of interest.

External influences.

Afghanistan, on the North-West Frontier of India, runs contiguous to the British and Russian frontiers, which are thus separated from Persia to China by a buffer state designed by the Durand Commission of 1904 to prevent frontier incidents. Up till 1919, Britain conducted any Afghan foreign communications, but since the 3rd Afghan War, the subsidy has been stopped and the Amir now controls an independent state and conducts his own foreign policy through the various Legations.

Russia.

This would work with complete harmony but for our restless neighbour beyond the Oxus. Ever since 1877 when the Allies vetoed the warm-water outlet at Constantinople, Russia has been scheming for a southern port, and extending her Empire in Asia. In 1885 she came in collision with the British at Penjdeh near Herat, and in 1904 with the Japanese at Port Arthur. The effect of the revolution has been a stiffening of the former policy, coupled with an openly expressed hatred of the British Empire and the employment of methods such as those at Elizavetpol and Bokhara, which the Czarist regime might have considered unduly

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harsh. After the war, the Soviet made various unsuccessful attempts to unite these various eastern dependencies for a common purpose, only to discover that the conservative people of the East can no more be united to the same outlook than the Hindoo and Moslem in India. After the sack of Bokhara in 1920, the error of this method became evident and the policy was changed. A system of racial disintegration was then adopted, and small republics were established on an ethnological basis, any one of which could be coerced at leisure independently. Thus instead of the old principalities of Bokhara and Khiva, these are now represented on the north of Afghanistan by the Soviet Republics of Turkmanistan, Usbegistan, Tajikistan, and Kara Kirghiz, each following ethnological divisions having direct tribal connection with existing Afghan communities south of the Oxus—each of these small states is suitably maintained in contentment until further developments render such altruism needless.

Russia makes no secret of her designs on India, and large sums of Soviet money are spent in the cause of disaffection, working with agents in India from Central Asia. So long as a strong and independent Afghanistan, however, intervenes between the two frontiers, any armed attack on India would be futile. A double line of rail would be needed to serve a modern army attacking and vast concentrations of depots and stores would be needed at some spot far more adjacent than the last terminus of the railway from Bokhara at Termez, on the Oxus. The defences of British India, both in the Khyber and at Quetta, the only possible routes for a modern army, are of remarkable strength, and backed by the might of the British Empire, a successful offence would require numbers and training not now attainable in Soviet Russia.

But there are other ways. A change of policy in Afghanistan, due to the death of some responsible personality, or to other causes, might make the task easier. The preparation at leisure of an advanced base of Soviet power in a friendly Afghanistan would bring India face to face with circumstances which might strain its resources to breaking point. There are several ways which an unscrupulous power can achieve these conditions even in the teeth of Afghanistan. First comes the power of money, subsidising disaffection and chaos against law and order, offering something

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to those who have nothing to lose at the expense of the existing owners who have traditionally been in the position of stern masters. When the Afghan proletariat, exploited themselves by an eastern potentate much as they were before the Christian era, see contented people in the neighbouring republics under a Government so far strong and apparently benign, enjoying many of the amenities of civilisation, some of them at least are apt to make comparisons. Why should not they too profit by trade and the comforts a railway can provide? Better housing and cheaper food and clothing appeal to the masses. Agents provocateur in the shape of an ever increasing number of traders, engineers and officials, are not wanting to point out the evils under which they now labour and the benefits of Soviet rule. In Herat it is made known by organised propaganda and by subtle suggestion that only one-third of the population is Afghan and the remainder are Arab or Balooch. Would they not be happier like the people of Merv or Penjdeh as part of the powerful Russian Empire? Soviet money continues to be lavished on peaceful penetration and trade subsidies till the people begin to rely on Russian enterprise, and so the game may go on till one fine morning the Amir may wake up to find his boundary 100 miles further south, a regularisation of the new status quo which has been gradually coming into being.

These subterranean forces of penetration are difficult to counter. Communications in Afghanistan are still primitive. The railhead at Termez brings Russian influence at least as near the Northern Provinces as a Central Government at Kabul connected by pack transport, and Russian survey parties have openly surveyed road and rail routes to the Anderrab Valley, a mere fifty miles north of Kabul. An Afghanistan, shorn of its northern provinces, even supported by Great Britain, would form a feeble buffer against further Russian aggression. These are a few of the contingencies we must consider, whether we are studying world politics or Imperial defence.

Progress under present Amir.

On the other side of the penny there are hopeful signs. The Amir, Aman Ullah, is a ruler full of character, brains and initiative, with the well-being of his country at heart. Untravelled

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and uneducated, he has yet arrived at many of the essentials needed to bring his kingdom into line with modern progress. In the face of great difficulty he has insisted on compulsory education. His place in the sun, or in the comity of nations, is vindicated by Legations which ensure his diplomatic entity. Advantage has been taken of the rates of exchange in Germany and Italy to import European doctors and engineers. The latter have continued the policy of Abdur Rahman in making the country so far as possible industrially independent of India, and developing factories for guns, leather, soap, textiles, etc. They have electrified Kabul and beautified the city. Five miles south a new capital is being constructed, Dar ul Aman, laid out on modern lines with vistas and avenues and well built buildings, both private and state, comparable with anything of its kind in Europe. The Army and Air Force are being re-organised on a national basis. Equipment of all kinds is being reviewed and modernised. Intensive training of the Headquarters armies is being attempted and young officers are being brought up to a higher standard of war tactics under the Arkan-i-Harbi, or Military School. All this has been done in spite of the opposition of the Mullahs, naturally averse from progress which might lessen their influence, and in spite of the recent Mangal rebellion which put a very severe strain on the resources of the Government.

Communications.

Afghanistan is probably, at the moment, by far the most isolated state in the world. Mosul and Bokhara were once harder to reach but communications to these places have now improved. Its frontiers on the north and west are naturally weak, while comparatively strong on the south and east. On the north, the Oxus is about 20 marches by pack transport from Kabul, through various defiles which offer little real difficulty to an invader, except in the matter of distance. Herat on the western frontier is easily accessible from railhead at Kushk Post, but 29 marches from Kabul. Kandahar in the south is surrounded by deserts and is difficult of access except from Kabul and Quetta. It follows, therefore, that the majority of the traffic with the outside world is through British India via the Khyber Pass, a route which is passable for motor traffic over difficult gradients and bad surface, but yet passable.

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Physical conditions.

The area of the country is 245,000 square miles (about 700 miles by 350)—a trifle larger than France—but of this the whole is so mountainous that only about 10% is capable of cultivation, apart from about 16% which is desert, and only about one-tenth of this arable area is actually in cultivation in any one year. This area tends to be reduced rather than increased by the Moslem custom of cutting trees without replanting, a practice which, meteorologically, has the effect of substituting destructive torrents for gentle rain. The whole country is under snow at times and the climate is very severe indeed, nor will the warmest sheepskins exclude the bitter winds blowing down the valleys from the great snow masses. The water supply is precarious except near the main rivers, and timber of all sorts is difficult to come by.

Population.

Obviously these conditions tend to breed a hardy race, where only the strongest can survive. Fiercely jealous of their independence, and till lately cut off from the outside world by their trackless hills, the tribesmen have a fanatical hatred of foreigners deeply seated in their natures. They were first united at the end of the 18th century by Dost Mahommad Khan and can only be controlled with success by such outstanding personalities as this Amir and Abdur Rahman who also imposed his will with a ruthless vigour which appealed to the Spartan characters of his subjects. Realising the hardships and vitality needed for an Afghan to reach maturity, they tend, as a race, to despise foreigners whose subtlety or science appears to Afghans a poor set-off against their own more obvious bodily strength and warlike prowess. True, the improved communications of the last decade have had their effect even in Afghanistan, and men are beginning to realise that other methods of living are not without their compensations. The Ghilzais for instance, embracing nearly a quarter of the population, migrate yearly to the plains of India, where they penetrate even as far as Burmah, and cannot fail to notice the changes coming over the unchanging East in these latter days. The country cannot remain a backwater for ever, and it is possible that the progressive methods of this ruler embody many of the ideas of his subjects,

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existing but perhaps not yet reaching the stage of national expression.

Retrospect.

A brief glance at the history of the country might give an insight into present conditions. The various tribes have been known as Afghans for about a thousand years, although they have only existed as a kingdom for under 200 years. Herat and Kandahar were once Persian, while Kabul and Ghazni acknowledged the Mogul dynasty at Delhi. Persian was, and is, the court language. Following on efforts of consolidation by the Ghilzais and Abdalis in the early 18th century, a dynasty of the latter seized the country on the murder of Nadir Shah in 1747 and assumed the title of Durani, with an empire from the Oxus to the Sutlej, including Kashmir, Sind, Baloochistan, the Punjab and Khorasan. But as often in the East, Durani power waned once the strong arm of its creator, Ahmed Shah, was removed, and the next stable government was under Dost Mahommad in 1826. Official relations with British India were opened in 1809, as a result of Napoleon's intrigues in Persia.

In 1828, the British took action to counter Russian and Persian intrigues, and decided on sending a force to relieve Herat and to replace Dost Mahommad by Shah Shuja who was likely to be more amenable to influence. War commenced in 1838, a leisurely, wasteful campaign, penalised from the start by lavish baggage, faulty leadership, and departmental ineptitude, but saved again and again by the sturdy heroism of the British troops who refused to acknowledge defeat although often pitted against a better armed enemy. Kandahar, Ghazni and Kabul were occupied in turn, and Shah Shuja was duly placed on the gadi, with a meagre garrison of one division of all arms to support his unpopular rule. Now followed a succession of criminal errors, both in policy and strategy. The army was encumbered with the families from India and the tribes were conciliated by payments instead of coerced by force. Hatred of the foreigner combined all classes in a fanatical antagonism to the British. In 1840 the Army was persuaded to leave the strong position of the Bala Hissar and occupy the Sherpur

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cantonment. Supplies became scarce, and on the 6th January, 1842, the shameful retreat commenced, guaranteed with treacherous assurances of safe conduct by Mahommad Akhar Khan. The force, if force it could be called, amounted to about a thousand British, four thousand Indian troops and twelve thousand followers, and many women and children. What followed is graphically described in Lady Sale's diary. The followers were slaughtered like sheep. Soldiers, demoralised by disgraceful concessions and vacillations, put up a poor fight against the knives and jezails of the fanatical Ghilzais who rushed them in detail in the narrow passes. A starving remnant of 45 officers and men made a final stand on a mound near the road at Gandamak, sixty miles on the Jelalabad road, but only one officer, Dr. Brydon, reached Jelalabad (110 miles) to tell the tale. Probably this was the most serious reverse sustained by the British Army in the East, nor has the Afghan forgotten it. The avenging force under General Pollock could not entirely undo its failure.

In 1855 an offensive defensive alliance was concluded between Dost Mahommad Khan and the Government of India, on a basis which still holds generally. During the Mutiny a British Mission was in Kabul and this influence sufficed till 1858 by which time the worst in India was over. Dost Mahommad meanwhile annexed Kandahar and Herat, and all went well till his death in 1863, when the usual succession difficulties arose, and Persia seized Herat while Russia made important advances in Central Asia. British diplomacy in settling new boundaries displeased the Amir, Sher Ali, who considered himself insufficiently consulted, and incidents accumulated until a British Mission was refused while a Russian Mission was entertained—a distinction which led to the second Afghan War of 1878-80.

This war, though relieved by the genius of Lord Roberts and others, showed lamentable defects in medical, transport and supply. Intelligence was defective and the campaign was hardly a shining example of frontier warfare. Conditions, however, were imposed and a British envoy was sent to Kabul, only to be murdered in September, 1879, together with four officers and seventy-five men of the Guides. Retribution followed, swift and drastic; the Bala Hissar was razed to the ground by Lord Roberts, and other penalties

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Barracks near the old Sherpur Cantonment.

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were exacted, but here again the return to India supplied little incidents like Maiwand which testify rather to the gallantry than the military arts of the British Army of those days.

Then followed the Penjdeh incident in 1885 already referred to, which nearly caused war between England and Russia. It was settled in Europe and resulted in hurried boundary commissions to remove future grounds for friction on the northern and western Afghan frontiers. In India, elaborate and costly defences were constructed in the Northern Punjab, athwart a possible Russian line of advance. Now we class these as expensive makeshifts. We can no longer afford even to contemplate the possibility of any Russian force in British India.

Afghan intrigues on the N.W. frontier of India in the nineties led to a series of British Punitive expeditions, culminating in the Durand Boundary Commission in 1894. Abdur Rahman had by this time broken the power of the chiefs and galvanised Afghanistan into a powerful and well armed military state. The terror of his administration was so formidable that on his death in 1901 his son, Habib Ullah, was able to ascend the gadi almost without opposition, and to administer himself almost unchallenged up till 1919. His friendship with India was a factor which had, of course, an important bearing on India's contribution to the Great War. It was only in 1919, on his assassination, that the usual succession troubles recurred until such time as his successor, Aman Ullah, the present ruler, was able to consolidate his power. He bought his experience in the third Afghan War, an experience he would probably hesitate to repeat. War at the moment would cripple his various improvement schemes, and as his rule becomes stronger every month he survives, he is not likely to forsake the substance in pursuing the shadow. But it is not man who disposes and other circumstances already touched on might still prove too strong for him.

Peshawar to Kabul.

Possibly a few details of the writer's actual journey and experiences might be of interest:—

Once the journey was decided on by those concerned, the formalities of passports and visa had to be complied with. Let no one imagine that urgency or convenience will hurry the machinery

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of the Afghan Consul General in such cases. The dignity of a Sovereign State precludes hurry, and patience becomes a necessary virtue. But it's a long lane that has no turning, and the party, consisting of the writer and two Indians, left Peshawar at 7 a.m. in November in a Dodge car hired from a local firm at Rs400 (£30) for the return journey—204 miles each way. The Khaiber Pass has now a broad gauge railway, but through passengers usually motor through from Peshawar, this method being quicker and more convenient than a break at Landi Khana (28 m.).

On the British side of the frontier a baboo duly recorded the various irritating details on our three passports. Two hundred yards further on was the Afghan post, whence somebody, best described as a male person, came down without undue haste to meet us. After a close inspection he returned to his hut on the cliff and telephoned to Dakka, six miles on. Apparently his description found favour and we were allowed to proceed.

From now onwards the track was unmetalled, but as the weather was dry, the Dodge springs good and our digestions above suspicion, the only thing that suffered was our pace. Dakka proved to be a collection of a few score mud huts, to one of which we ascended, and shook hands with various persons, all apparently with exceedingly good intentions but not imbued with that spirit of hustle, which, as no doubt they have calculated, reduces longevity in America. Various details of age, past, peculiarities, birth marks, sex, etc., had to be entered in the records, but the process and the friendly converse being as good a way of killing time as most, occupied us a full hour.

The track now follows the Kabul river more or less. Various German engineers are laying out a new alignment for the road, but as they control the technicalities and not the funds, laying out may last five years. At the same time the existing track is quite passable in good weather, and the ground is generally level. In fact the whole fifty-eight miles from Landi Khana railhead to Jelalabad could probably be completed with broad-gauge track at a mile a day in emergency.

Beyond a puncture or two all went well to Jelalabad, our halt for the night. We passed a landing ground three miles out, and heard that the Amir trusts much in his air service to keep his

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frontiers quiet. Jelalabad is the centre of a fertile plain on both banks of the Kabul river. The walled city is less than half a mile in diameter, but much of importance, such as Abdur Rahman's old Bagh-i-Shahi, the new palace, Habib Ullah's tomb, the barracks, jail, and many villas are to be found outside. The new palace is a modern affair, well laid out, and fitted with electric light. An Englishman can walk about in safety alone, a state of affairs, one is told, due in a large measure to the influence of the present Minister.

The car, and incidentally, the Legation weekly Crossley tender halted for the night in the British Consulate, which is directed by a consul born in Dera Ismail Khan. It is a comfortable serai and house rented from the Afghans. Here money was changed, at the rate of about 9 annas—say 10½d.—for a Kabul rupee.

Next day was to be a long pull rising 8,000 feet in ninety miles, so a start was made at 6.20 a.m. (5.20 local sun time), using the head lights. It is usual to make Nimla, twenty miles on, the first day, but as the guest house is an Afghan one, certain previous formalities are necessary, hence the halt at Jelalabad. The house which we passed about 7.30 at Nimla is in a well wooded garden in attractive surroundings with snow clad hills.

Now the ascent began. The Dodge was pulling well, but the second gear slipped a bit, and the road was bad, full of boulders and rough stones, with diversions through torrents, where, as in most cases, the bridges were out of repair. The driver stopped about three miles short of Jagdalak for food at 10 a.m. Good progress so far. Now, however, the clutch jammed and a puncture delayed matters. We had only spare tubes left and both spare wheels were in use. There came a very steep and stony ascent after Surkhpul Dak Bungalow and delays continued. Twenty-five miles out of Kabul we were in the snow on both sides of the road about 9600 feet up, freezing hard. There was a delay of two hours here owing to the spare tubes being defective, and involving the removal of no less than four outer covers. By now it was 5.30 p.m. We passed the dam in the Khurd Kabul pass built for hydro-electric purposes. The scenery here is very rugged and impressive—a fitting site for the disaster to British arms in 1842.

Twilight found us at Butkhak nine miles from Kabul, the out-

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side customs station. Here some Afghan baboos strolled along, patted the driver, sounded the horn and behaved generally in an engaging and childlike manner. They only delayed us five minutes. Next we arrived at the city examining post just outside Kabul. Here was another bonhomie merchant, who finally expressed his affection by depositing his portly frame on the pile of baggage for a joy-ride into the city. And so we reached the Legation just before seven with a thirst of great value.

The Legation.

The British Legation is situated in a serai once used by the Amir's "Anderum," or harem. The main portion is about 80 yards square, with a wall 23 feet high, all rooms facing inwards. Pending the construction of buildings suitable to the status of a first class power about a mile away, this site is being rented at the same figure as the Afghan Legation in London. Originally of a distinctly Eastern flavour it has now been adapted to the requirements of a Legation with extraordinary taste and culture, and one feels that the honour of England is duly upheld, and also that one is entering an Englishman's home.

The guest chamber consists of two rooms 16 feet by 20 feet, and a bathroom 16 feet square, all well but simply furnished. The Staff consists of the Minister and Lady Humphrys, the Councillor, Secretary, Doctor, and Military Attaché. These, with four British clerks and one British P.W.D. Engineer and his assistant building the new Legation, constitute the entire English colony, the smallness of which gives us an advantage over the other nations, who are handicapped by the need for protecting a number of their nationals employed by the State on often very inadequate wages.

Kabul from the hills above the city.

As the car only reached Kabul at dusk, it was not possible that night to form a good idea of the city, so well known to the British Army in 1840 and 1880. The next day, Friday, however, is observed as a *dies non* by the Afghans and no work was possible, so the obvious thing to do was to climb the Asmai hill about 1000 feet (6918) above the Legation. From here a magnificent view of the Kabul Valley is obtained. The main valley is about five miles by

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Kabul—from Asmai Hill—showing racecourse, Arg, Palace and Sherpur Cantonment, but not the native city.

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twenty, running north and south. Looking north was the Sher Darwaza hill (7280) on the right, with the great city immediately below it. Beyond the city one sees the site of the Bala Hissar destroyed in 1880 by the British owing to the murder of the four British officers and their escort of seventy-five Guides. Beyond that, about three miles distant, is the once fortified Siah Sang (6186). Due north lay Lord Roberts' Cantonment of Sherpur, about one mile by half a mile, of which half is now barracks and half a landing ground. In the far distance, over a hundred miles away, lay the great white barrier of the Hindoo Kush, showing up a glittering mass against the snow ranges all round the valley. On the left is the Bagh-i-Bala, the house where Abdur Rahman died, now a hospital. Just below is the site of the new Legation now being built, laid out with modern comforts on English lines. The reception room is 80 feet by 40 feet and all the other rooms are on a similar scale, including a billiard room and a squash court. The staff are housed in separate parts of the garden, which is about 400 yards by 600 yards. Looking south on the right one sees Paghman, the Eylaq or summer retreat of the Kabul society. South-west runs the motor road to Ghazni and Kandahar, crossing a pass about twelve miles out. Due south is a long straight broad road running five miles clear to Dar-al-Aman, the Amir's new capital. On the left is the tomb of the Emperor Baber on an outlying spur— a rugged and majestic site for the simple soldier's grave.

Summer retreat.

Next day, after lunch, came a journey with our hostess in the Wolseley car to Paghman—about nine miles out and 9000 feet up, roughly the November snow level. This is the summer capital, and consists of about 200 houses built on the Riviera model. The whole area is planted with fruit trees and well laid out, without the cutcha etceteras one associates with the East. A cinema and theatre form part of the plan, and the foreign office, council chambers and other Government buildings are all included. The trouble about Kabul in summer is the wind and dust, although the temperature itself seldom goes over 105°, so that this retreat is much appreciated. The Amir's house is at the top of the slope, a beautifully planned modern villa rather marred by the brilliant

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Venetian red colour wash. The garden is laid out in terraces, and near the house are a drawing room on a sort of roofed chibootra and a billiard room of the same structure. The garden is full of statues, then being covered with date matting against the winter snow. Some thirty or more peacocks, one pure white, add to the landscape.

Above the villa—presumably beyond the carry of the human voice—is the "Anderum," or women's apartments. One sympathizes with the sagacity which prompts placing the women where they are available as required, but only as required. Large additions are in progress. But then we ourselves might tend to become more domesticated under such ideal arrangements.

After leaving Paghman we motored about eight miles along the side of the hills to Beitut, one of Abdur Rahman's hunting lodges which was lent to the Minister one summer. It is built on the edge of a steep slope overlooking a wonderful panorama. The builder was English and the possessor it seems of imagination.

The new Capital.

We returned towards Kabul but struck right and south about two miles out towards Dar-ul-Aman, the capital now being built by the Germans. It is a city of vistas, laid out on impressive lines. The Mujlis Chamber (or Houses of Parliament) is sited on an elevation at the end of the broad five miles road with 100 feet of metalling, while behind the Mujlis is the Palace. The houses are all very well built on what appears to be a suitable plan for the climate, i.e., like an Indian bungalow with bedrooms over the larger central rooms.

A ride to the north.

After work next day, four of us, one a lady, went for a ride on the plain. This is an area five miles by one on the north-west of Kabul. In winter half of it becomes a lake, with wonderful colouring. Now it affords perfect cantering for miles. We had a good view of Kabul and the Behmaru heights above Sherpur Cantonment. The place of execution was pointed out, mostly gallows, but the Afghans run a special line in stoning which is said to be less comfortable owing to the studied absence of hurry,

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which, if desired, is obtained by propelling the offender from a gun. We saw the power lines from the hydro-electric installation at Jabel el Siraj Cantonment about forty-five miles north of Kabul. At the further side of the plain we came out at the old aerodrome, now under Bolo management. Three "piadeh" or infantry soldiers dashed out 200 yards to warn us off. But we waited with quiet persistence for an officer, listening to the cackle of drill repetition, and deprecating the somewhat forcible efforts of the three soldiers to send us back, although the C-in-C had agreed to our riding here. The officer arrived, a dear little boy of about sixteen. He tried hard to look stern, but soon broke into a giggle, and told us all would be well if we made a slight detour, which we gracefully did. Coming back we passed through part of the old Sherpur Cantonment, now made into an aerodrome. The whole place has been razed. Hangars have been constructed on the south and west, and the air power of the future will be centred here. Behmaru hills on the north are a distressing obstacle at a height of 6,000 feet where the air is far from buoyant, but the space is a large one, and they'll make it do. We got home about six. It freezes hard all day in the shade and we were glad of a good fire in the very comfortable drawing room.

On Monday 15th, a party of four went to a jhil about twenty miles out and brought back a bag of fifteen duck and fourteen snipe. They reported very heavy going and all got into black mud over the waist.

The city.

One afternoon was spent riding in the great city with a sowar. Here 150,000 people are concentrated in an area considerably smaller than Westminster, a hive of narrow streets, covered bazaars and struggling masses of pedestrians and pack animals. The bazaars are the clubs of the Eastern world and meet the need for social intercourse, in which of course the equality of sex is on a very different footing from the West. Anyone dropped in a parachute into this curling tangle of obscure alleys would find it hard to say, apart from the language, whether he had alighted in Stamboul or Damascus, Baghdad or Teheran, Aleppo or Bokhara. One is very much like the others. Perhaps in Kabul the Eastern politeness

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with which the European existence is ignored is a trifle more studied and deliberate. The Afghan can afford to adopt an attitude impossible in other cities where European influence is a far sterner factor. Here such Europeans as exist are mostly ill-paid subordinates, jostled with the rest. The British Minister whose prestige stands very high in the land, makes a great point of his own small colony making their occasional visits to the city on horseback, aloof from the surging of the crowd. From this point of vantage they can observe the landmarks of city life, customers and coolies, shrouded mysterious women and canine scavengers, priceless silks and age-long filth in close contact. But modernism is creeping in already. Motor horns tootle through the winding passages, here and there being straightened out into broader highways. People find the value of sites on the new arteries compensates for the cost of purchase and demolition of their old hovels. Electricity is replacing oil, the Germans and Italians are slowly importing the amenities of civilisation into the capital, which, like London, forms the very centre of national life.

Personalities.

During the five days in Kabul one had opportunity of meeting many of the people that mattered. Their manners are good and one cannot but be attracted by their frank friendliness if one meets them in the right spirit. The War Minister struck one as efficient, and seemed to have his house in order. There seemed something indescribably reminiscent of the French Army in their ways of doing business. The Brigadier with whom the writer had most to do was a man one could enjoy as a guest in any Gunner Mess, but for the language bar. He had a true appreciation for Rabelaisian stories in Persian, a trait which proved to have value even in official business. Lieut.-Genl. Sami, recently head of the Military College, was another attractive personality. He was a genial Arab, with an uncanny aptitude for military science, very popular among Europeans in Kabul. These and the old world hospitality of the British Legation made a very pleasant interlude in Kabul—days which can never recur, for all too soon this quaint old capital will be caught up in the maelstrom of progress and modernised out of recognition.

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Back to India.

In the end we crept out of the frozen city just before dawn. The pass of 9600 had to be negotiated, and water for the radiator had to be carried separately, only ice being available on the road, and we plodded on through intense cold, hairpin bends and rocky goat tracks for thirteen hours before we covered the 110 miles to Jelalabad. The rest was easy.

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MUGGER SHOOTING IN INDIA.

By "Ubique."

INDIA is a land of big rivers and in most of them crocodiles are to be found. Up till quite recently they were seldom shot because tiger, panther, bear and many other species of game were plentiful and the average Englishman despised the "mugger" as a quarry, but now that expense has ruled out so many shooting trips there are many keen shikaris who have turned to crocodile shooting rather than put away their rifles altogether.

There are two distinct types of crocodiles in India—the "Crocodilus Palustris" or mugger proper and the "Gharialus Gangeticus" or gharial. The former is a flesh eater and lives in ponds or rivers with jungle covered banks while the latter is a fish eater preferring broad rivers with sandbanks and mud flats. The two are not difficult to distinguish for while the true mugger has a short snout in which the teeth are unevenly placed, the gharial has a very long pointed snout. Generally speaking the mugger is found in Southern India while the fish eater inhabits the northern rivers, especially the Indus and the Sutlej. About eighteen feet is the extreme length of a gharial but the fish eater often exceeds twenty-three feet or more.

The crocodile is well endowed by nature with means of protection for his back is covered with heavy, bony scales of great hardness which are practically unaffected by a soft nosed bullet. His neck, however can be easily penetrated while the white skin of the stomach is greatly prized on account of its toughness. The mugger has a formidable tail of great strength and a blow from it will easily knock over a man or break a leg. The enormous leverage of the heavy jaws enables him to snap a bone with the greatest ease though it is curious that the teeth are very brittle and will not allow him to tear a victim to pieces as is popularly supposed. The crocodile normally drags his prey under water and

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drowns it after which it is disposed of at leisure. Usually he prefers to hide the body in some hole in the river bed until it is putrid, though hunger will sometimes force him to make a more hurried meal. Goats, cattle, water buffaloes, deer and human beings are all likely prey of the mugger and in some parts of India the loss of life caused by these reptiles is very serious. Buffaloes wallowing in shallow water are dragged down, women washing their clothes are seized, fishermen wading in the river disappear and it is no wonder that the Sahib with a rifle is welcomed by the exasperated villagers. In most cases it is the true mugger who is responsible, for the gharial lives almost entirely on fish, but the bigger gharial do sometimes take to a flesh diet. The writer recently shot a sixteen foot "fish-eater" which was undoubtedly the cause of a water buffalo's sudden disappearance a few hours before.

Although the crocodile lives almost entirely in the water he sometimes makes quite considerable journeys overland, when compelled to seek a fresh home owing to the drying up of his pond during the hot weather. It is surprising how quickly he can move on land in spite of his short legs, and it should be noted that he waddles with his body off the ground and does not crawl. These overland trips are, however, only taken in cases of necessity but all crocodiles love to bask in the sun on a sandbank and this is the opportunity for the sportsman. During the hot weather the water is so warm that there is no inducement for a crocodile to leave it, but on a sunny day in the winter months he will select some sloping sandbank and lie for hours in the sunshine. The mugger is never far from the water—usually within a yard and is generally seen with his head towards the river. He nearly always chooses a sandbank in mid stream and for this reason the hunter seldom gets a shot at less than a hundred yards range and two hundred yards is more usual. The slightest sign of a human being is enough to frighten the crocodile so that careful stalking is required.

The best way to approach mugger is to drift downstream in a boat. A look-out man in the bows equipped with glasses should be able to spot the quarry some hundreds of yards ahead and the boat is then gently paddled into the bank. Having decided from where he expects to get the best shot, the shikari should land and approach this point by a detour, taking great care to avoid being

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seen or heard. He should then examine the mugger carefully through his glasses while he waits to get his breath. It must be remembered that a crocodile must be hit in the neck thus severing the spinal column and causing instantaneous death. Any other wound, though it may be fatal, will not take immediate effect, and it only requires one flick with the powerful tail to put the mugger in the water and out of sight. It is very difficult to realise the extraordinary vitality of a crocodile but it is undoubtedly true that to shoot at any point other than the neck is merely a waste of time and ammunition. Now the neck of say a ten foot crocodile at two hundred yards range is not a large target and good shooting is needed to get a bull first time. Even if the bullet hits the target squarely the mugger is often only partially paralysed and not killed and may require several more shots to finish him off. A case recently occurred where a fourteen foot gharial was hit by two soft-nosed bullets simultaneously in the neck but yet required nine more hits before he died and by then the body was half in the water. One can afford to take no chances with a mugger, as the writer can testify after having been implicated in a brawl (in company with another officer, two coolies and two terrier dogs) with a "dead" six foot mugger which came to life half an hour after being hauled into the small boat. It sometimes happens that a crocodile which has been badly wounded and which has succeeded in regaining the water will return to the sandbank after a short interval. The reason for this is doubtful but probably the small fish in the water cause him so much irritation by tearing at the raw wound that he is driven onto the bank to escape their attentions. If the mugger is mortally wounded he will die in the water rather than on land and the body will sink. It will come to the surface in about twenty-four hours time but the chances of recovery are small for the stream may take it many miles down river.

The mugger should be skinned as soon as possible after death but in the Punjab it may be done in the evening after settling into camp. An incision should be made along the sides of the stomach above the legs. The back is useless but the skin of the stomach, throat, legs and the underneath portion of the tail should be removed in one piece. The skin should then be scraped clean and packed in salt—not alum. It is important to keep the skin

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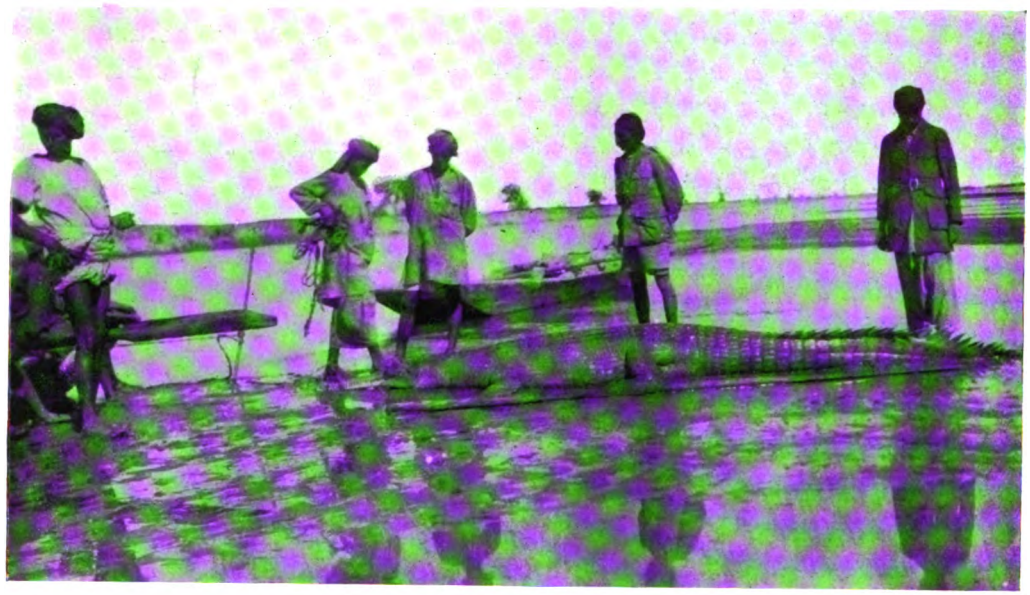
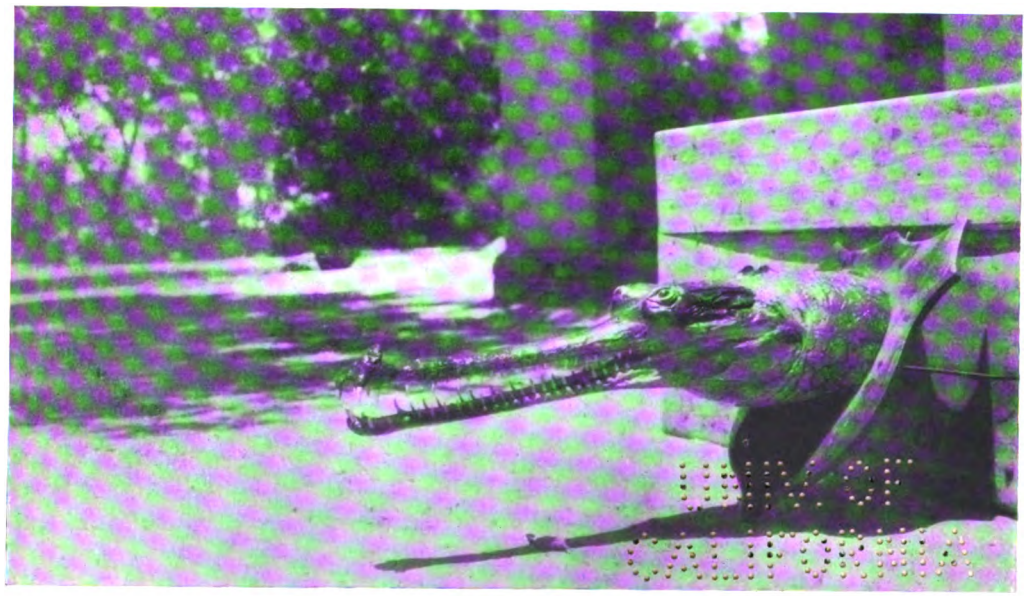


A 14½ ft. Gharial shot in the Sutlej river.



Head of 14 ft. Gharial.

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moist until it can be despatched to a tannery for proper treatment. Skins can be cured in any bazaar but it is better to send them to a good tannery (such as Shewan's Tannery, Cawnpore or the North-Western Tannery, Cawnpore) as the bazaar native uses chemicals in the tanning process which are injurious to the leather. The process takes about six months and costs between one and two rupees a linear foot but the finished product is valuable and is worth waiting for. If it is desired to retain a mugger head, care should be taken to see that plenty of the skin of the neck is left attached. Every particle of flesh must be removed from the skull and the tongue cut out together with the eyes. In the case of either skins or heads the really important point to insist on is that the trophies should be sent to the tanner as quickly as possible and should reach him moist as well as salted. The most fatal mistake to make is to dry a crocodile skin in the sun or near a fire.

Almost any modern small bore rifle firing soft-nosed bullets is suitable for mugger shooting but for the larger crocodiles a calibre of at least 350 should be used. Owing to the very great accuracy required it is advisable to carry two small forked rifle rests, one made of wood for use in sandy soil and one of iron with a sharp point for use on hard ground. A telescopic sight is also a great help and indeed almost a necessity, for it is practically impossible to see the neck of a small mugger over open sights at two hundred yards range. Plenty of ammunition should be taken for if mugger are at all plentiful a hundred rounds per rifle in six days will be found to be an average expenditure.

The writer and another officer went on a mugger shoot from Ferozepore (on the Sutlej river) last cold weather and found that the following arrangements worked very satisfactorily. The shikari was ordered to have two boats ready and into one was packed all the baggage, tents, provisions together with two bearers. This boat was instructed to follow a quarter of a mile behind the first. After proceeding upstream for four days, the return journey was made in two days. Camp was pitched on the river bank about sundown each evening and a start made about nine o'clock each morning. (The mugger do not leave the water till the sun has been up for some hours and has warmed the sandbanks.) The expenses of this trip worked out as follows:—

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Tongas, etc. (6 miles) from railway station, coolies, etc.	10	0
Hire of two boats and coolies for 6 days at Rs6 per boat per day	72	0
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Food, etc., for 2 officers for 6 days	50	0
200 rds. ammunition (100 rds. per rifle) ...	60	0
	202	0

The total bag was 26 mugger varying in size from 15 feet to 4 feet with an average of just over 6 feet, so that mugger shooting cannot be said to be an expensive amusement, especially if the value of the skins be taken into consideration.

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